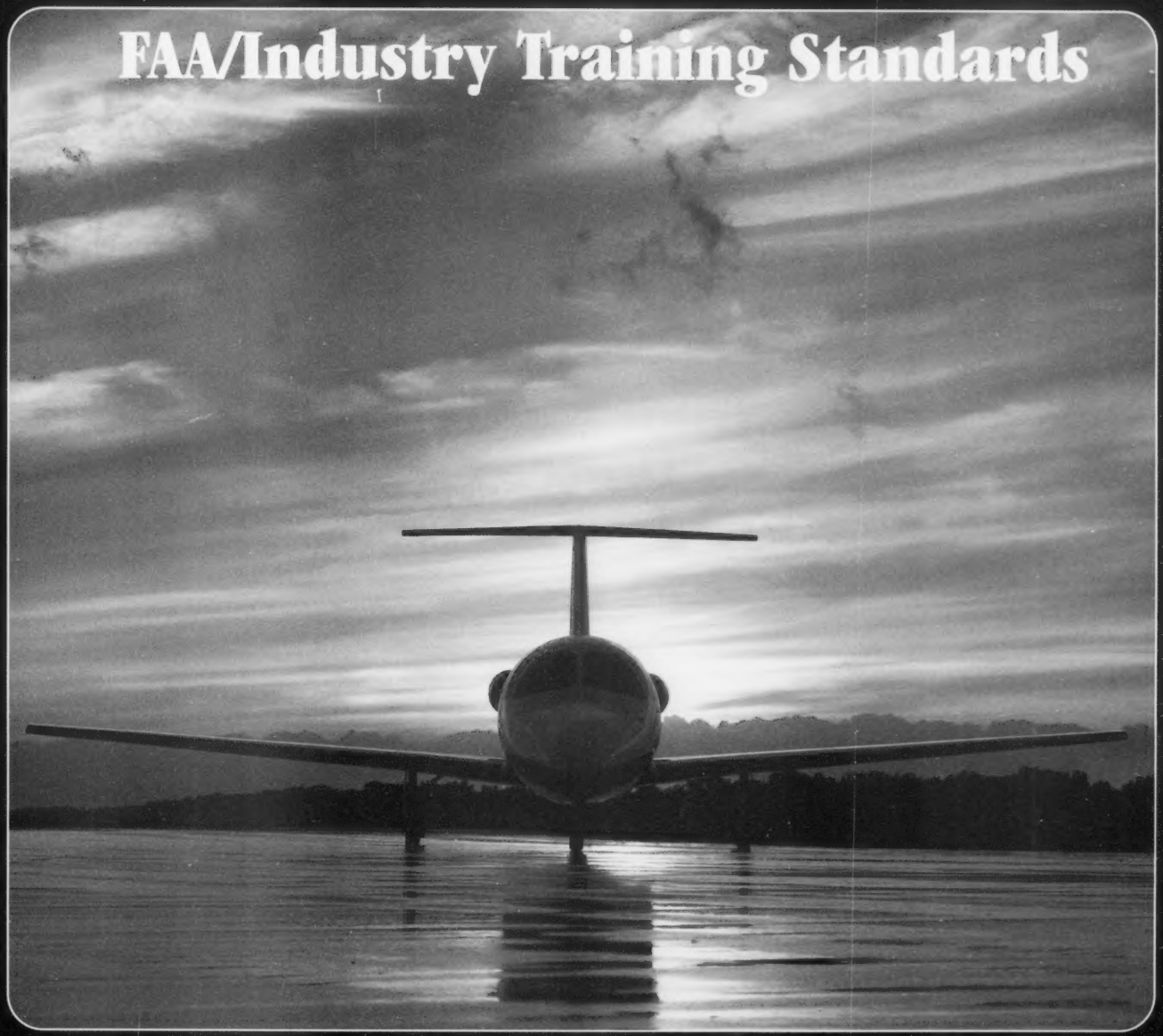
MARCH/APRIL 2003

Aviation News

AVIATION SAFETY FROM COVER TO COVER

Cover Story:

FAA/Industry Training Standards



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FAA Aviation news

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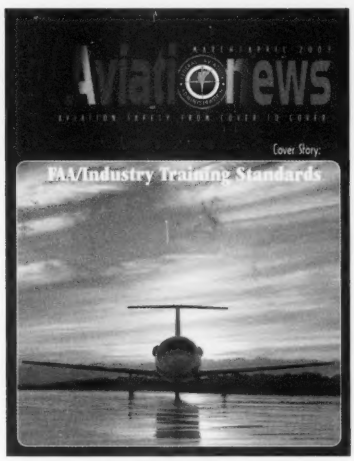


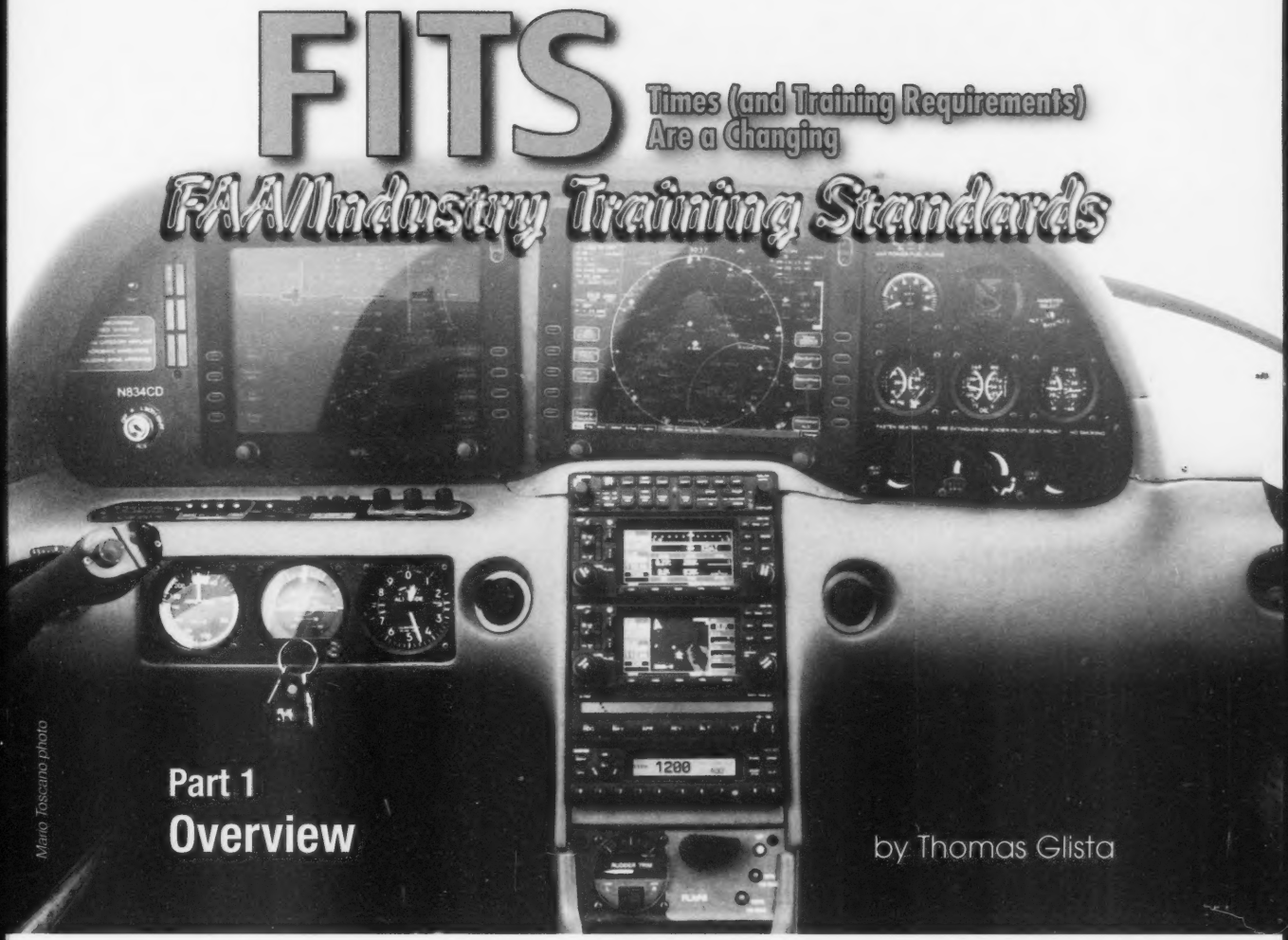
FRONT COVER:The new Eclipse 500 at sunrise. (photo courtesy of Eclipse Aviation)

BACK COVER: The new Cirrus Design SR22. (photo courtesy of Cirrus Design Corp.)

FITS

Times (and Training Requirements) Are a Changing

FAA/Industry Training Standards



Mario Toscano photo

Part 1
Overview

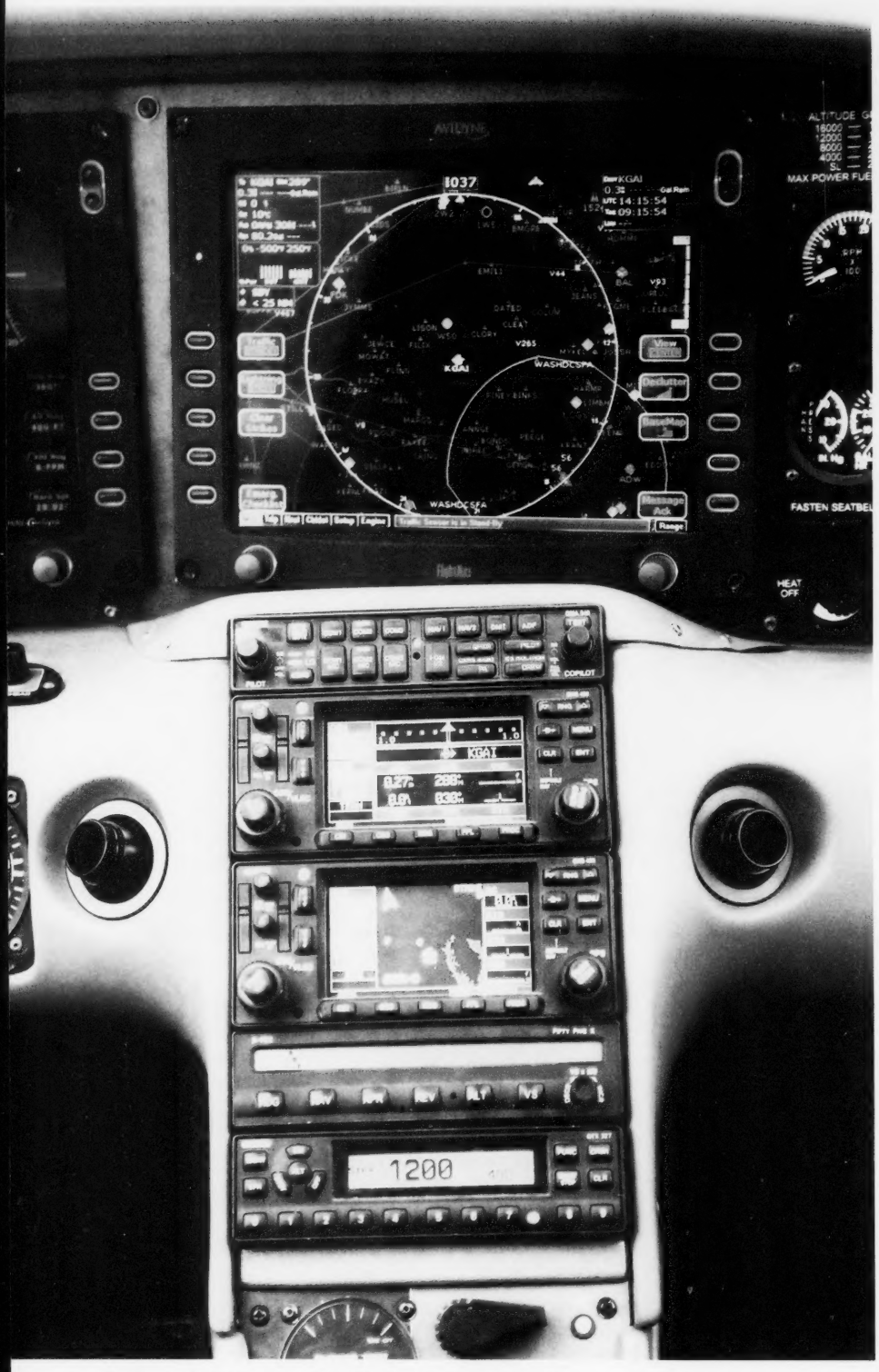
by Thomas Glista

This is Part 1 of a three-part article regarding the future of general aviation training. It describes a modernized, pro-active FAA approach to match its general aviation policies and procedures with new aircraft, new avionics, and new flight technologies.

A one time one-size-fits-all training approach best describes the current general aviation training paradigm. The aircraft might be single engine or twin engine, but the technological systems (better known as cockpit instruments) were mostly standardized. However, new developments in technology have changed these generic systems, which in turn change the way that pilots need to be trained. To fill this need the FAA initiated the FAA/Industry Training Standards Program or FITS.

Under the FITS program, the FAA works with industry partners, old and new, to develop industry consensus standards for pilot training and checking. The use of consensus standards is explained in OMB Circular A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities. This circular "directs agencies to use voluntary consensus standards in lieu of government-unique standards except where inconsistent with law or otherwise impractical."

To train a safe pilot better in less time and with less cost, new and innovative ways to train are being developed. With older technological systems, it did not matter who built the system. They all functioned and looked similarly. Unfortunately, new technological systems (such as the Global Positioning System or GPS, as it is better known) that perform similar functions may not look alike and pilot interaction with these systems may be completely different. Consequently, "one-size-fits-all" training may no longer be adequate. The FITS program seeks an evolutionary approach to change, which is responsive to the pace of development in the general aviation community and which take



The Cirrus SR-22 instrument panel. (Mario Toscano photo)

place within the current Federal aviation regulations. As new technology and aircraft are being developed, the FITS program will allow the FAA, along with its industry partners, to identify future training needs and develop training products appropriate to the needs of the users.

The many new technological developments will have a pronounced effect on general aviation flight operations, as new cockpit, flight technologies, and aircraft are developed and brought to the market. Ultimately, these changes will also affect general aviation training. For example, the complexity of the airspace will increase as the National Airspace System (NAS) is modernized and the FAA's Operational Evolution Plan (OEP) takes effect. The OEP is the FAA's ten-year plan to increase the capacity and efficiency of the NAS while enhancing safety and security. It has identified four core problem areas that it will concentrate on—arrival/departure rates, en route congestion, airport weather conditions, and en route severe weather.

To show how this collaboration between the FAA and industry works, the FITS program has two "launch customers." Eclipse Aviation is developing a new small, six-place, turbojet aircraft. Elite Air Center will train pilots to fly advanced technology reciprocating engine-powered aircraft, such as the Cirrus SR-22.

Safer Skies is a major FAA initiative tasked with achieving a significant reduction of fatal accidents by 2007. Under the Safer Skies program, the FAA and FITS customers will be working with the Air Transportation Center of Excellence for General Aviation. Public Law 101-508 enabled the FAA to grant one or more colleges or

universities to establish and operate an air transportation center of excellence. These centers form a cumulative repository of knowledge in a variety of subjects (such as airspace, airport design, and aviation safety and security) and encompass the entire spectrum of research and development from basic research to engineering development and prototyping. In March 2001 the FAA established the Center For General Aviation Research (CGAR). This team, lead by core member Embry-Riddle Aeronautical University includes the University of North Dakota, the University of Alaska, Wichita State University, and Florida A&M. The goal of the Center for General Aviation Research will be to develop synergistic relationships, which can significantly enhance opportunities for innovation in general, aviation research activity. For more information on CGAR you can visit their Web site at <http://www.cgar.org>.

FITS focuses on the segment of general aviation that uses single pilot, small reciprocating or turbojet powered aircraft for transportation. Air carriers and larger two-pilot corporate jets already have extensive training requirements. The safety record of two-pilot corporate jets is just about the same as air carriers. At the lower end of the general aviation spectrum, the light-sport pilot rule is being developed using consensus standards in accordance with OMB Circular A-119. Additionally, it is expected that light-sport pilots (when the rule is finalized) and recreational pilots will be limited to the size and complexity of aircraft that they can fly, to what airspace they can operate in, operate only in VFR conditions, and to carry only one passenger. This limits their potential exposure to hazards.

It is the middle area of general aviation activity, personal or professionally flown single-pilot aircraft (both piston engine and turbine-powered) with new technologies, that is the current focus of FITS. FITS will develop three categories of training standards.

1. **Generic FITS for the general aviation community as a whole**. Generic standards will be developed for broad categories of training functions, such as the flight review, complex- and high-performance training, and other functions. Individual training entities (e.g. flight instructors, pilot schools) may adapt them for a particular aircraft or other scenarios.

2. **Specific FITS program for a specific aircraft or technology.** Specific standards will be developed for a particular customer or application. For example, the FITS launch customers are Eclipse Aviation and Elite Air Center. They will be working with the FAA and the Center of Excellence for General Aviation to prototype and implement initial, transition, recurrent, and flight instructor training requirements of their customers and flight operations.

Future specific FITS will be developed as new aircraft and new technologies require. For example a specific FITS might be developed to train a pilot on a specific display or capability the pilot has retrofitted into his or her aircraft.

- **Mandatory FITS standards in accordance with 14 CFR §61.31(h)**. In rare instances, the FAA may elect to invoke 14 CFR §61.31(h) to require aircraft type specific training for aircraft with unusual operating characteristics or flight systems to ensure safe operations. Because of the regulatory implications of this FITS, notice and/or public comment would normally be required to implement

this provision. Promulgation could be through an amendment of the aircraft flight manual, which refers to the FITS standard directory.

It is not the intention of the FITS program to change regulations. FITS will use flexibility within the current regulations to provide incentives. For example, a pilot school may be approved for a combined private/instrument curriculum under 14 CFR §141.57, Special Curricula. If approved under §141.57, the graduates may not be required to have the minimum hour requirements of 14 CFR part 61 or the appendixes in part 141. Innovative training programs (which may include some type of simulation or flight training devices) could result in a reduction of the time and cost of receiving a certificate.

There are other flexibilities within the regulations, even if you already have a pilot certificate. Although the FAA is open to other ideas (let's think outside the box), we have not researched all possibilities, but one is the flight review requirements in 14 CFR §61.56. There are many ways to comply with this rule. You could: receive one hour of flight instruction and one hour of ground instruction (§61.56(a)); pass a pilot proficiency check (§61.56(d)); or satisfactorily accomplish one or more phases of an FAA-sponsored pilot proficiency awards program (§61.56(e)). Now what is an FAA-sponsored pilot proficiency awards program? Yes, we all know about the "WINGS" program, but it might not only be that. The FAA can approve other programs as a pilot proficiency program. We would like to see continuing education programs that apply to the operations of a particular pilot. For example, every six months a pilot could complete a training module lesson at home on his or her computer (on-line or CD). Training modules could be tailored to the area the pilot lives (high altitude, mountainous train, complex airspace, etc.), the time of year (winter operations, icing conditions, thunderstorms), and the type of aircraft the pilot flies. Sometime in that two-year period the pilot must fly with an authorized flight instructor. Training will be more complete, more applicable, and more convenient.

The FAA also plans to discuss FITS with most of the major aviation insurance companies. The aviation insurance community may embrace the concept of greater standardization in training. Some may be willing to give premium credits (read money) or better coverage to pilots who train under this type of program. The ultimate goal of the FAA with the FITS program is to help you become a better and safer pilot using incentives such as greater convenience, more relevant training, or ordered costs.

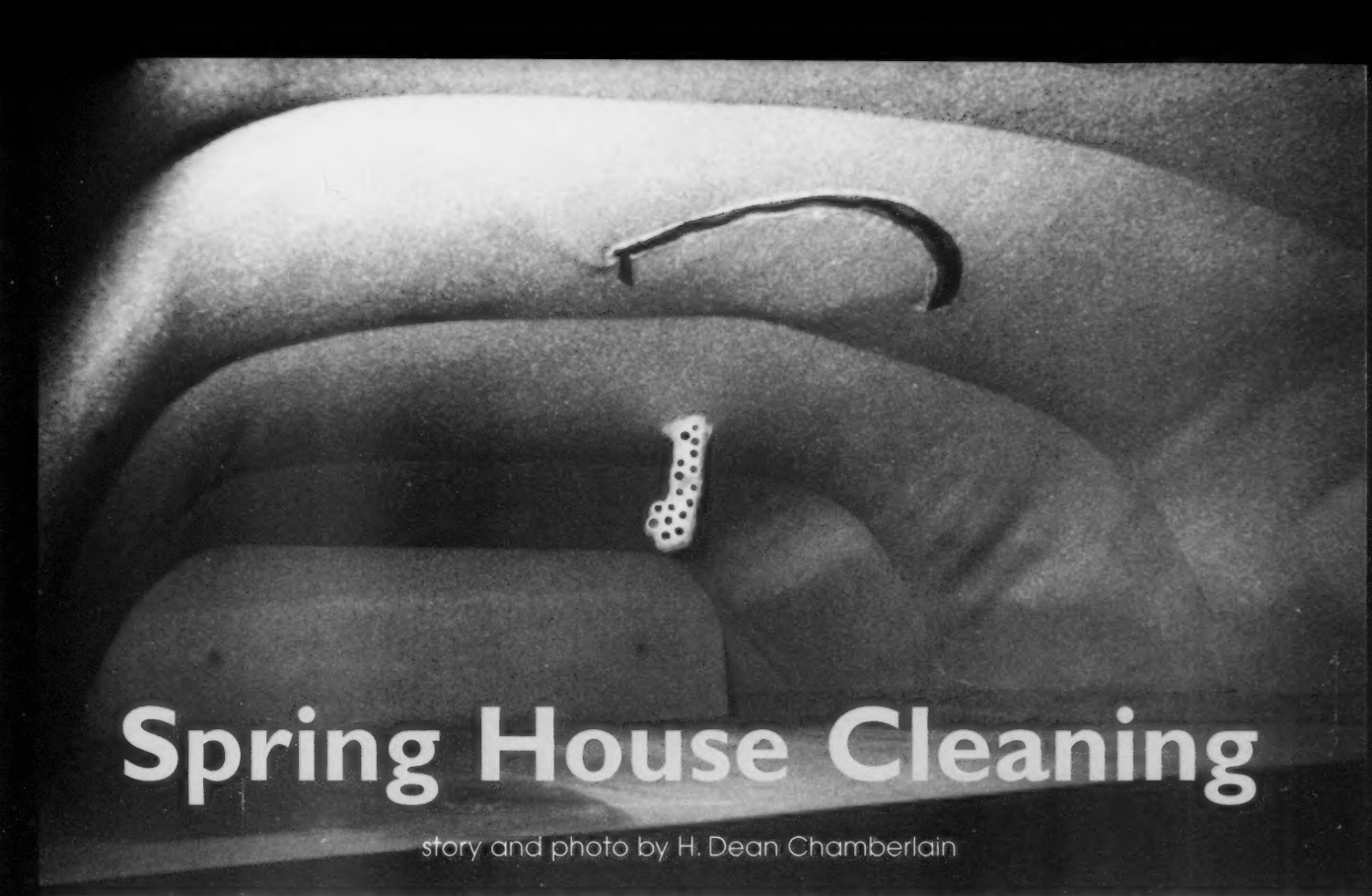
Why are manufacturers or equipment providers getting involved in FITS? Accidents and incidents are some of the worst things that can happen to a manufacturer, besides giving the aircraft a bad reputation (which results in lower sales), insurance cost to the manufacturer increases (higher costs). Proper training is the key to safe operations. One of the main reasons air carriers are so safe is that the pilots are continually trained. Their training is not general in nature. Air carrier training is aircraft and mission specific.

In general aviation, training is more generic. With older technological systems, it did not matter who built the system. They all functioned and looked similar. New aircraft and technologies are being developed in general aviation. Unfortunately, new technological systems that perform similar functions may not look alike and pilot interaction with these systems may be completely different. Consequently, "one-size-fits-all" training may not be adequate. There is no question that general aviation is modernizing. The responsibility rests with the FAA to ensure that aviation safety is not compromised in the process. That is where FITS come in. The outlook is worth the wait.

Thomas Glista is an Aviation Safety Inspector in Flight Standards' General Aviation and Commercial Division and leads the FITS program. In the next issue, Glista will discuss the current status of FITS.

Cirrus SR22

Mario Toscano photo



Spring House Cleaning

story and photo by H. Dean Chamberlain

Just as many people do annual spring house cleaning; many aircraft owners do annual spring aircraft cleaning. The reason is simple. Many personal aircraft are not flown as often during the winter as during the summer. And since many aircraft are tied down outside, it is hard to work on them during the winter months because of the limited amount of daylight and cold weather if you are based in the northern tier of the country. Even if your aircraft is kept in a hanger, you may not have heat in the hanger. If you add in some snow and ice, it is even harder to get to the airport, much less work outside, if you don't have hangar space. All of this adds up to the question of how to clean and prepare your aircraft for the upcoming flying season.

Uninvited Guests

The first reminder is a comment and warning about things that fly, crawl, bite, and sting. In a past *FAA Aviation News* article, we reported about a major bird-nest building project in the tail section of an aircraft. The photographs we published showed just how much material a bird or two could carry into an aircraft in a few days time. Equally amazing was the question of how did the bird or birds get that material into the aircraft.

As some of you may remember, my personal aircraft restoration project has been ongoing for three years. In those three years, the aircraft has been in a well-sealed hanger with electricity and heat for several months. It spent more time in a hanger that gave new meaning to wide-open spaces. But the most surprising discovery during this whole process was finding a major mud daubber wasp "housing development" constructed in only a few days while the aircraft was in the well-sealed hangar. The construction site was in the small "hat" storage area above the baggage compartment behind the rear seat. At the time of discovery, the storage area was full of small aircraft parts and rolls of paper towels. The nest or "vertical condominium" was suspended from the cloth headliner in about the middle of the storage area. What is surprising about the mud nest was that it was made in the well-sealed hanger, and the nest was surrounded by parts and paper rolls. Where the wasps came from, we never could find out. The only thing we knew for sure was the fact that not only did they get into the open aircraft, but they managed to build such a big nest in seemingly only a few days without anyone noticing. The photograph shows what was built. (Various items were removed to better show the nest.) The wasps managed to build their nest even though we were working on the aircraft during this period, and we never saw the wasps—or should I say we are fortunate the wasps never saw us.

This is only one example of what insects can do seemingly "overnight." Throughout the restoration project we have had to keep looking for other nests in other locations. Since the aircraft's wings and fuselage have been open more than three years, looking for other nests has been an ongoing project. And yes, we have found a few more as we have started closing up the aircraft.

What this means to you, is if you have not carefully inspected your air-

craft for evidence of birds or insects, or things that crawl in the night, you might takeoff with guests you don't want to fly with.

The other problem with uninvited guests is the potential damage they can do. For example, bugs in the pitot system can result in erroneous airspeed readouts. If a bug has made its home in your aircraft static system, do you know what can happen to your airspeed reading during ascent, level flight, and descent if the pitot portion of your system is blocked? What happens if the static line is blocked under these three flight conditions? In addition to a blockage of your pitot or static system lines, there is also the risk of additional damage to your vacuum system and instruments if any of the debris gets sucked into your air-operated instruments.

In the case of nests—such as bird nests or those of mice or squirrels or similar type creatures—the nests, dropped food items, and other droppings can all contribute to corrosion and other damage to your aircraft. Then there is always the possibility of the nest or debris causing a fire or blocking a control function. I was surprised at the size of the wasp's mud nest and how hard it was. It might have blocked my controls if it had been built in a critical area.

Because of my personal experience, I recommend that if you have not flown your aircraft recently that you or your mechanic inspect your aircraft for possible uninvited guests. An inspection mirror and a flashlight are great tools for looking into those hard to see in places. If you find something, not only do you have to remove it, but you need to double check for any residual damage such as the start of any corrosion near or below the nest or for any control interference. And as I have found out, if one critter finds your aircraft a good home, then others may have also found it inviting. You need to really check the aircraft thoroughly.

Cleaning Materials

Depending upon what type of nest you find, you should review your aircraft manual for a list of recommended cleaning material. You don't want of make a minor aggravation into a serious maintenance problem by using the wrong type of cleaner. You can also check with your mechanic for a recommended cleaning method.

Since birds seem to love to sit above hangared aircraft, bird dropping can be particularly difficult to remove. If you plan on cleaning your windshield or side windows, you need to carefully follow your aircraft's recommended cleaning methods. The wrong cleaner or the right cleaner used incorrectly can damage your window or windows even more. You never want to rub or grind anything hard into the surface of the window. If you do, you run the risk of scratching the window. This is why we are all told early in our flying never to rub a dry windshield with a cloth to clean it. This is also why we are told to always gently wash any dirt or dust off a window before using window cleaner on the plastic. It also helps to wipe a window in straight lines rather than in swirls. You want to minimize the risk of causing any type of damage that would make it hard to see through the window. As you know, sunlight passing through a damaged window can make it extremely difficult to see out of the window. This is especially true if the sun is low in the sky.

In replacing all of the windows in my old plane, I discovered in interesting piece of trivia that I had never thought about. I just assumed that breakable plastic was used in my side windows because that was what was available years ago. But I found out there is an important safety issue with replacing windows with the most unbreakable plastic available. If you have an accident and can't open a door, your only way out may be through a side window. If it is unbreakable, you have a problem. If it is breakable, you break it and go out the window.

"House" Cleaning Chores

Other important spring-cleaning areas include the battery compartment. Not only should you check the battery for proper charge and recommended fluid level, if the battery is so constructed, and tight connections; but you should also check for any damage to its casing as well as any corrosive damage to the battery compartment case.

Fuel and oil supplies should be checked for both the proper quantity and quality. If you have not flown much over the winter, water may have found its way into your fuel tanks and lines. Making sure your oil supply is the proper weight for your flight temperatures is important. You may want to replace your oil filter if your aircraft is so equipped.

Cleaning and inspecting your tires and brakes is another good house keeping item. Is the air pressure in each tire the correct pressure? Is everything lubricated?

Have you cleaned out all of the junk and miscellaneous things your aircraft has accumulated throughout its various storage bins, under the seats, and in the baggage area? It is amazing how many items an aircraft can pick up on a trip.

As you clean and wax your aircraft, you might want to replace all of those outdated charts you have onboard.

And finally, as you clean your aircraft and prepare it for another flying season, the most important preparation you can make, as an aircraft owner, is a little self-cleaning. If you have not been flying frequently, you might have a little rust on you. You might want to go to your local flight instructor for a little refresher training. Throw in a few hours of flight time and studying and earn your next phase of "Wings" under the FAA's Pilot Proficiently Award Program outlined in FAA Advisory Circular 61.91H. The added bonus is that this could also be used in lieu of a required flight review.

So plan now to start the 2003 summer flight season with a clean aircraft and some fun flight training. We wish you a great 2003 flying season, and we hope you avoid those things that fly, crawl, bite, and sting.

Balloon Incident

by Allen Amsbaugh

More and more balloonists, or aeronauts, have become aware of and are using the Aviation Safety Reporting System (ASRS) to report safety concerns or perceived violations. A review was performed of 109 ballooning incidents reported to the ASRS from 1990 to 1994. There were no reports from gas balloon or airship flights, possibly a reflection of the low level of activity in these sectors. Also, there were no reports from any of the highly publicized long distance or altitude flights. This may reflect the extra caution, care, and planning that goes into these flights, as opposed to the casual weekend sport flight or the flights taken by commercial pilots.

Most of the reporters state that weather and winds were the cause of their incidents. These adverse wind and weather conditions are often found only in a very small area and thus may be termed micro-meteorological conditions. Weather briefers tasked with providing area and airport-specific aviation forecasts may be unable to provide micro-meteorological forecasts or reports about conditions of concern to the balloonist. Consequently, most observation is done by the balloonist on the spot after getting all available official reports. This often leads to surprises, incidents, accidents, and sometimes, to tragedy.

Sixty-five of the 109 reports listed weather factors as the cause of the incident. (See Figure 1.)

As may be seen in Figure 2, forty-three of the weather-involved reporters (66%) listed unforecast increasing winds as their problem. Nine reports attributed their difficulties to thermals, or other downdrafts, forcing the balloon into the ground. An additional eight reports listed becoming becalmed as the source of their dilemma—not enough wind can be almost as hazardous as too much. One aeronaut became becalmed over trees at sunset, and pulled himself to a clearing by using the treetops. Finally, five reports were received from pilots who found themselves VFR in IMC due to fog or fast-forming clouds underneath.

What Happens in Balloon Incidents

In truth, probably all of the balloon incidents could be considered weather related, as low-level flights to find suitable landing sites, landing in residential areas, and hard landings are usually caused by winds that are not favorable to the balloonist. Even some of the ground incidents undoubtedly involved unreported weather factors.

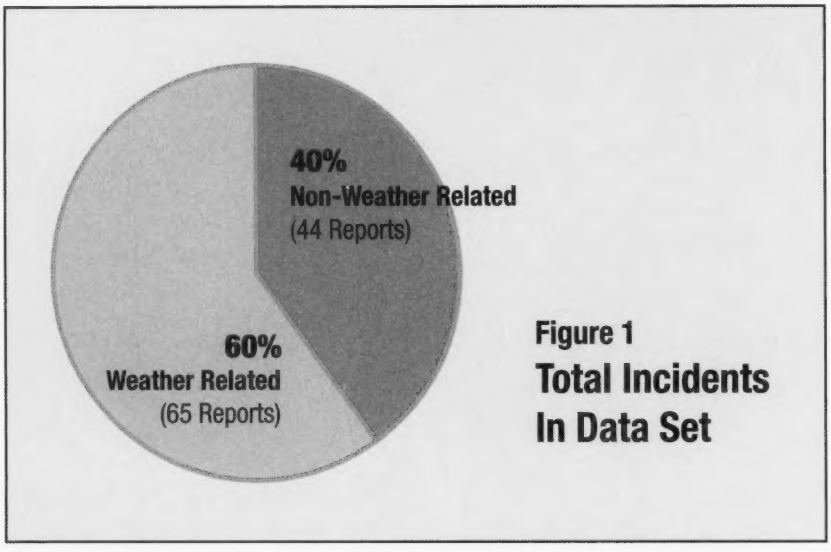


Figure 1
Total Incidents In Data Set

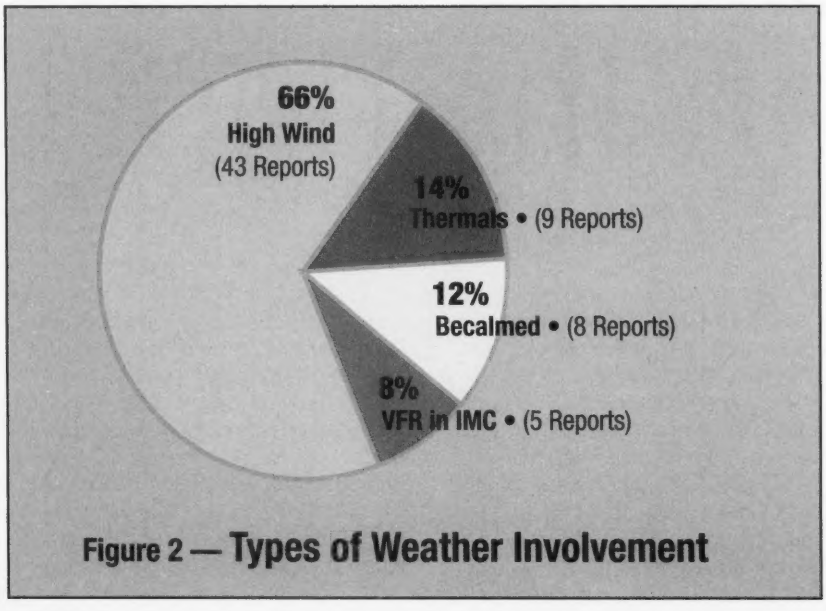


Figure 2 — Types of Weather Involvement

Airspace Problems

Eleven of the incidents reported involved airspace violations by aeronauts who found themselves inside the edge of Class "B," "C," or "D" airspace without proper radio contact due to a wind shift, faulty or no radio, or faulty navigation. Two aeronauts were intercepted by Air National Guard F-16's while in R-5503. The balloons were flying legally; it was the fighters who were in the airspace early and no NOTAM had been issued.

Airborne Conflict

Midair collisions between balloons accounted for nine of the incidents with five reporting damage and one reporting an injury. Most balloon midair collisions are of the "kiss" variety where there is very little relative velocity. Reports concerning damage and injury were of the variety where the lower balloon did not observe commonsense rules in a crowded situation. In one incident, the lower pilot climbed rapidly into a balloon above. The balloon below has the right-of-way because of the lack of visibility, but this does not allow the lower balloon to climb rapidly. In an attempt to preclude this type of mishap, most balloon meets limit the climb and descent rates to 200 feet per minute.

Six of the reports were from air carrier pilots who encountered balloons in "their" airspace. The gist of their reports was that they were loath to share the airspace and were surprised by the presence of the balloons.

Conflict with Ground and Objects

Seventeen of the reported incidents concerned flights into power lines, the one incident which causes the most fatalities in ballooning. In one third of these incidents, the reporters stated that the power lines were obscured in trees. More than half re-

ported minor damage, and three reported injuries.

There have been other reported injuries, including two broken ankles, to passengers who were not wearing proper footwear in a "ride" balloon. Another ASRS incident record describes one of the more serious types of incidents when working with balloons or airships—attempting to hold the aerostat down by hanging onto a line or the exterior of the basket. In this instance, a crewman lost his grip and fell, breaking an arm and an ankle. No one should ever let his or her feet leave the ground when handling a lighter-than-air vehicle.

They Don't Understand

One of the problems aeronauts find in almost every flight is the notion, "If you're having fun, or doing something unusual, it must be illegal!" This attitude seems to be pervasive among unknowledgeable observers. One reporter describes a balloon landing on a boat in a lake after becoming becalmed. The aeronaut and his balloon were successfully retrieved, only to find themselves on the evening news! Fortunately, the local FSDO was able to laugh with the aeronaut over this. In another incident, a balloon was seen flying through the tops of some trees, an accepted practice to slow forward velocity, and then landed safely in a vacant area. The observer was the local fire chief who "called out the artillery."

Table 1 - Balloon Incident Results

Incident	Citations	Percent
Low Altitude Flight	22	20%
Power Line Contact	17	16%
Landing in Residential Area	17	16%
High Wind/Hard Landing	12	11%
Airspace Violations	11	10%
Miscellaneous	11	10%
Ground Incidents[1]	10	9%
Mid-air Collisions	9	8%
Ground Personnel Perception[2]	8	7%
VFR in IMC	8	7%
Balloon in "Airplane's" Airspace[3]	6	6%
Livestock Incidents	4	4%
Propane Leak/Fuel Contamination[4]	4	4%
Totals	**139**	**128%**

1. Balloon did not fly, or the light had terminated.
2. Reporter claimed to have done nothing wrong, but was threatened by being reported to higher authority by a homeowner, police, etc.
3. Reported by airplane pilots.
4. One on the ground, two in the air, one contamination

Multiple citations are possible in any given category, thus the combined totals of citations and percentages shown here are greater than 109 citations and 100 percent, respectively.

The Sky Is Falling

Four incidents related to livestock on the ground. One involved a typical "balloon dog" that got upset, then barked and upset its owner. In another report, the balloon spooked some cattle, and in another incident, the balloon flew low over an aviary that was not on the pilot's chart. The most serious incident was the alleged spooking of a horse. Its rider was thrown and suffered a broken arm.

Other Hazards

Balloon fatalities can also result from a propane leak, either in flight or on the ground. Three reporters listed a propane leak — two in the air and one on the ground. In one incident there was damage, and the other resulted in injury. In a fourth incident, an aeronaut reported fuel contamination of an unknown source.

Counting the Problems

Of the 109 incidents studied, 25 reported damage to their balloon or to another balloon; 13 reported injuries; and 25 reported official action taken, mostly by local law enforcement or fire departments.

The Final Word

Reading these incident reports reminds one that ballooning can be a hazardous sport, but there are actually few injuries and little damage. Nonetheless, the following suggestions may help reduce the potential for incident:

- Obtain all available weather information;
- Carefully observe local conditions before committing to flight;
- If unfamiliar with the micro-meteorology of any area, seek local advice from experienced balloonists;
- Brief passengers and crew on all normal and abnormal preflight, inflight, and post-flight procedures.

This article originally appeared in the ASRS Directline, *Issue Number 9.*

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What Happens in Balloon Incidents

In truth, probably all of the balloon incidents could be considered weather related, as low-level flights to find suitable landing sites, landing in residential areas, and hard landings are usually caused by winds that are not favorable to the balloonist. Even some of the ground incidents undoubtedly involved unreported weather factors.

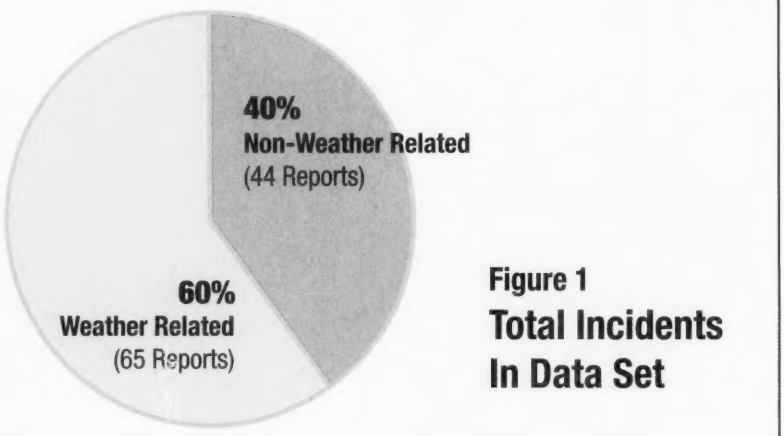


Figure 1
Total Incidents In Data Set

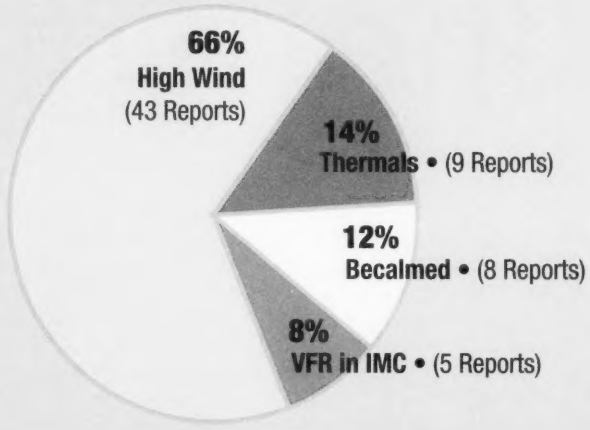


Figure 2 — Types of Weather Involvement

Airspace Problems

Eleven of the incidents reported involved airspace violations by aeronauts who found themselves inside the edge of Class "B," "C," or "D" airspace without proper radio contact due to a wind shift, faulty or no radio, or faulty navigation. Two aeronauts were intercepted by Air National Guard F-16's while in R-5503. The balloons were flying legally; it was the fighters who were in the airspace early and no NOTAM had been issued.

Airborne Conflict

Midair collisions between balloons accounted for nine of the incidents with five reporting damage and one reporting an injury. Most balloon midair collisions are of the "kiss" variety where there is very little relative velocity. Reports concerning damage and injury were of the variety where the lower balloon did not observe commonsense rules in a crowded situation. In one incident, the lower pilot climbed rapidly into a balloon above. The balloon below has the right-of-way because of the lack of visibility, but this does not allow the lower balloon to climb rapidly. In an attempt to preclude this type of mishap, most balloon meets limit the climb and descent rates to 200 feet per minute.

Six of the reports were from air carrier pilots who encountered balloons in "their" airspace. The gist of their reports was that they were loath to share the airspace and were surprised by the presence of the balloons.

Conflict with Ground and Objects

Seventeen of the reported incidents concerned flights into power lines, the one incident which causes the most fatalities in ballooning. In one third of these incidents, the reporters stated that the power lines were obscured in trees. More than half re-

ported minor damage, and three reported injuries.

There have been other reported injuries, including two broken ankles, to passengers who were not wearing proper footwear in a "ride" balloon. Another ASRS incident record describes one of the more serious types of incidents when working with balloons or airships—attempting to hold the aerostat down by hanging onto a line or the exterior of the basket. In this instance, a crewman lost his grip and fell, breaking an arm and an ankle. No one should ever let his or her feet leave the ground when handling a lighter-than-air vehicle.

They Don't Understand

One of the problems aeronauts find in almost every flight is the notion, "If you're having fun, or doing something unusual, it must be illegal!" This attitude seems to be pervasive among unknowledgeable observers. One reporter describes a balloon landing on a boat in a lake after becoming becalmed. The aeronaut and his balloon were successfully retrieved, only to find themselves on the evening news! Fortunately, the local FSDO was able to laugh with the aeronaut over this. In another incident, a balloon was seen flying through the tops of some trees, an accepted practice to slow forward velocity, and then landed safely in a vacant area. The observer was the local fire chief who "called out the artillery."

Table 1 - Balloon Incident Results

Incident	Citations	Percent
Low Altitude Flight	22	20%
Power Line Contact	17	16%
Landing in Residential Area	17	16%
High Wind/Hard Landing	12	11%
Airspace Violations	11	10%
Miscellaneous	11	10%
Ground Incidents[1]	10	9%
Mid-air Collisions	9	8%
Ground Personnel Perception[2]	8	7%
VFR in IMC	8	7%
Balloon in "Airplane's" Airspace[3]	6	6%
Livestock Incidents	4	4%
Propane Leak/Fuel Contamination[4]	4	4%
Totals	**139**	**128%**

1. Balloon did not fly, or the light had terminated.
2. Reporter claimed to have done nothing wrong, but was threatened by being reported to higher authority by a homeowner, police, etc.
3. Reported by airplane pilots.
4. One on the ground, two in the air, one contamination

Multiple citations are possible in any given category, thus the combined totals of citations and percentages shown here are greater than 109 citations and 100 percent, respectively.

The Sky Is Falling

Four incidents related to livestock on the ground. One involved a typical "balloon dog" that got upset, then barked and upset its owner. In another report, the balloon spooked some cattle, and in another incident, the balloon flew low over an aviary that was not on the pilot's chart. The most serious incident was the alleged spooking of a horse. Its rider was thrown and suffered a broken arm.

Other Hazards

Balloon fatalities can also result from a propane leak, either in flight or on the ground. Three reporters listed a propane leak — two in the air and one on the ground. In one incident there was damage, and the other resulted in injury. In a fourth incident, an aeronaut reported fuel contamination of an unknown source.

Counting the Problems

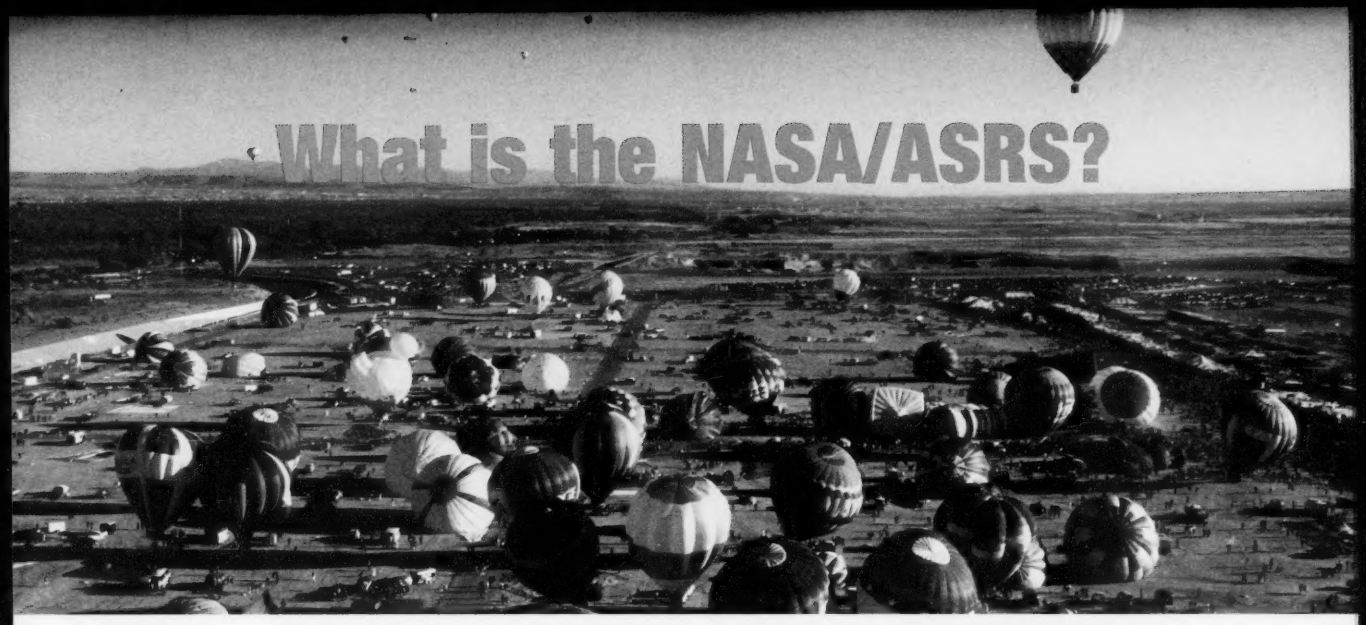
Of the 109 incidents studied, 25 reported damage to their balloon or to another balloon; 13 reported injuries; and 25 reported official action taken, mostly by local law enforcement or fire departments.

The Final Word

Reading these incident reports reminds one that ballooning can be a hazardous sport, but there are actually few injuries and little damage. Nonetheless, the following suggestions may help reduce the potential for incident:

- Obtain all available weather information;
- Carefully observe local conditions before committing to flight;
- If unfamiliar with the micro-meteorology of any area, seek local advice from experienced balloonists;
- Brief passengers and crew on all normal and abnormal preflight, inflight, and post-flight procedures.

This article originally appeared in the ASRS Directline, *Issue Number 9.*



What is the NASA/ASRS?

The primary mission of the FAA is to promote aviation safety. To further this mission, the FAA instituted a voluntary Aviation Safety Reporting Program (ASRP), designed to encourage the identification and reporting of deficiencies and discrepancies in the airspace system. The FAA determined that the ASRP effectiveness would be greatly enhanced if the receipt, processing, and analysis of raw data were accomplished by the National Aeronautics and Space Administration (NASA) rather than by the FAA. This would ensure the anonymity of the reporter and of all parties involved in a reported occurrence or incident and, consequently, increase the flow of information necessary for the effective evaluation of the safety and efficiency of the system.

To ensure your anonymity, NASA will return the identification strip to you once they are sure that no further information is required from you. The identification strip, stamped by NASA, is proof that you have submitted a report to the ASRS. Also, Title 14, Code of Federal Regulations §29.25 specifies that FAA will not use reports submitted to the NASA under the ASRP (or information derived there from) in any enforcement action except information concerning accidents or criminal offenses which are wholly excluded from the Program. In addition, the reporter cannot have been involved in any enforcement action within the previous five years and the incident must be reported to ASRS within 10 days of the event.

This cooperative safety reporting program invites pilots, controllers, flight attendants, maintenance personnel, and other users of the National Airspace System (NAS), or any other person, to report to NASA actual or potential discrepancies and deficiencies involving the safety of aviation operations. The operations covered by the program include departure, en route, approach, and landing operations and procedures, air traffic control procedures and equipment, crew and air traffic control communications, aircraft cabin operations, aircraft movement on the airport, near midair collisions, aircraft maintenance and recordkeeping, and airport conditions or services. The effectiveness of this program in improving safety depends on the free, unrestricted flow of information from the users of the NAS. Based on information obtained from this program, FAA will take corrective action as necessary to remedy defects or deficiencies in the NAS. The reports may also provide data for improving the current system and planning for a future system.

For more information on the ASRS, FAA Advisory Circular 00-46C is available on FAA's Web site at <www.faa.gov> or check the ASRS Web site at <http://asrs.arc.nasa.gov/forms_nf.htm>.

Reporting Forms

The NASA/ASRS Reporting Forms (General, ATC Controller, Maintenance, and Cabin Crew) can be obtained free of charge from FAA Flight Standards District Offices, FAA Flight Service Stations, or from the ASRS Web site at <http://asrs.arc.nasa.gov/forms_nf.htm>.

Click on the link for the appropriate form and you have two choices for submitting an incident report:

1. Fill out the form on your computer, print the completed form, attach all pages together, enclose in an envelope, seal, affix sufficient postage, and mail to ASRS at the address below, or

2. Print the uncompleted form, fill it out by hand, attach all pages together, enclose in an envelope, seal, affix sufficient postage, and mail to ASRS.

Please do not e-mail or fax an incident report or any incident information to ASRS! Electronic mail communication is not secure. Therefore, ASRS cannot accept incident reports by e-mail. ASRS is working on developing secure electronic submission of aviation safety incident reports in future. Mail your completed form to:

NASA Aviation
Safety Reporting System
P.O. Box 189
Moffett Field, CA 94035-0189

DO NOT REPORT AIRCRAFT ACCIDENTS AND CRIMINAL ACTIVITIES ON THIS FORM.
ACCIDENTS AND CRIMINAL ACTIVITIES ARE NOT INCLUDED IN THE ASRS PROGRAM AND SHOULD NOT BE SUBMITTED TO NASA.
ALL IDENTITIES CONTAINED IN THIS REPORT WILL BE REMOVED TO ASSURE COMPLETE REPORTER ANONYMITY.

(SPACE BELOW RESERVED FOR ASRS DATE/TIME STAMP)

IDENTIFICATION STRIP: *Please fill in all blanks to ensure return of strip.*
NO RECORD WILL BE KEPT OF YOUR IDENTITY. This section will be returned to you.

TELEPHONE NUMBERS where we may reach you for further details of this occurrence:

HOME Area _____ No. _____ Hours _____

WORK Area _____ No. _____ Hours _____

NAME _____

ADDRESS/PO BOX _____

_____

CITY _____ **STATE** _____ **ZIP** _____

TYPE OF EVENT/SITUATION _____

_____

DATE OF OCCURRENCE _____

LOCAL TIME (24 hr. clock) _____

PLEASE FILL IN APPROPRIATE SPACES AND CHECK ALL ITEMS WHICH APPLY TO THIS EVENT OR SITUATION.

REPORTER

- ☐ Captain
- ☐ First Officer
  - ☐ pilot flying
  - ☐ pilot not flying
- ☐ Other Crewmember
- ☐ _____

FLYING TIME

total _____ hrs.

last 90 days _____ hrs.

time in type _____ hrs.

CERTIFICATES/RATINGS

- ☐ student
- ☐ private
- ☐ commercial
- ☐ ATP
- ☐ instrument
- ☐ CFI
- ☐ multiengine
- ☐ F/E
- ☐ _____

ATC EXPERIENCE

- ☐ FPL ☐ Developmental
- radar _____ yrs.
- non-radar _____ yrs.
- supervisory _____ yrs.
- military _____ yrs.

AIRSPACE

- ☐ Class A (PCA)
- ☐ Class B (TCA)
- ☐ Class C (ARSA)
- ☐ Class D (Control Zone/ATA)
- ☐ Class E (General Controlled)
- ☐ Class G (Uncontrolled)
- ☐ Special Use Airspace
- ☐ airway/route _____
- ☐ unknown/other _____

WEATHER

- ☐ VMC ☐ ice
- ☐ IMC ☐ snow
- ☐ mixed ☐ turbulence
- ☐ marginal ☐ tstorm
- ☐ rain ☐ windshear
- ☐ fog ☐ _____

LIGHT/VISIBILITY

- ☐ daylight ☐ night
- ☐ dawn ☐ dusk
- ceiling _____ feet
- visibility _____ miles
- RVR _____ feet

ATC/ADVISORY SERV.

- ☐ local ☐ center
- ☐ ground ☐ FSS
- ☐ apch ☐ UNICOM
- ☐ dep ☐ CTAF
- Name of ATC Facility: _____

	AIRCRAFT 1	AIRCRAFT 2
Type of Aircraft (Make/Model)	(Your Aircraft) _____ ☐ EFIS ☐ FMS/FMC	(Other Aircraft) _____ ☐ EFIS ☐ FMS/FMC
Operator	☐ air carrier ☐ military ☐ corporate ☐ commuter ☐ private ☐ other _____	☐ air carrier ☐ military ☐ corporate ☐ commuter ☐ private ☐ other _____
Mission	☐ passenger ☐ training ☐ business ☐ cargo ☐ pleasure ☐ unk/other_____	☐ passenger ☐ training ☐ business ☐ cargo ☐ pleasure ☐ unk/other_____
Flight plan	☐ VFR ☐ SVFR ☐ none ☐ IFR ☐ DVFR ☐ unknown	☐ VFR ☐ SVFR ☐ none ☐ IFR ☐ DVFR ☐ unknown
Flight phases at time of occurrence	☐ taxi ☐ cruise ☐ landing ☐ takeoff ☐ descent ☐ missed apch/GAR ☐ climb ☐ approach ☐ other _____	☐ taxi ☐ cruise ☐ landing ☐ takeoff ☐ descent ☐ missed apch/GAR ☐ climb ☐ approach ☐ other _____
Control status	☐ visual apch ☐ on vector ☐ on SID/STAR ☐ controlled ☐ none ☐ unknown ☐ no radio ☐ radar advisories	☐ visual apch ☐ on vector ☐ on SID/STAR ☐ controlled ☐ none ☐ unknown ☐ no radio ☐ radar advisories

If more than two aircraft were involved, please describe the additional aircraft in the "Describe Event/Situation" section.

LOCATION

Altitude _____ ☐ MSL ☐ AGL

Distance and radial from airport, NAVAID, or other fix _____

_____

Nearest City/State _____

CONFLICTS

Estimated miss distance in feet: horiz _____ vert _____

Was evasive action taken? ☐ Yes ☐ No

Was TCAS a factor? ☐ TA ☐ RA ☐ No

Did GPWS activate? ☐ Yes ☐ No

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA has established an Aviation Safety Reporting System (ASRS) to identify issues in the aviation system which need to be addressed. The program of which this system is a part is described in detail in FAA Advisory Circular 00-46D. Your assistance in informing us about such issues is essential to the success of the program. Please fill out this form as completely as possible, enclose in an sealed envelope, affix proper postage, and and send it directly to us.

The information you provide on the identity strip will be used only if NASA determines that it is necessary to contact you for further information. THIS IDENTITY STRIP WILL BE RETURNED DIRECTLY TO YOU. The return of the identity strip assures your anonymity.

AVIATION SAFETY REPORTING SYSTEM

Section 91.25 of the Federal Aviation Regulations (14 CFR 91.25) prohibits reports filed with NASA from being used for FAA enforcement purposes. This report will not be made available to the FAA for civil penalty or certificate actions for violations of the Federal Air Regulations. Your identity strip, stamped by NASA, is proof that you have submitted a report to the Aviation Safety Reporting System. We can only return the strip to you, however, if you have provided a mailing address. Equally important, we can often obtain additional useful information if our safety analysts can talk with you directly by telephone. For this reason, we have requested telephone numbers where we may reach you.

Thank you for your contribution to aviation safety.

NOTE: *AIRCRAFT ACCIDENTS SHOULD NOT BE REPORTED ON THIS FORM. SUCH EVENTS SHOULD BE FILED WITH THE NATIONAL TRANSPORTATION SAFETY BOARD AS REQUIRED BY NTSB Regulation 830.5 (49CFR830.5).*

Please fold both pages (and additional pages if required), enclose in a sealed, stamped envelope, and mail to:

NASA AVIATION SAFETY REPORTING SYSTEM
POST OFFICE BOX 189
MOFFETT FIELD, CALIFORNIA 94035-0189

DESCRIBE EVENT/SITUATION

Keeping in mind the topics shown below, discuss those which you feel are relevant and anything else you think is important. Include what you believe really caused the problem, and what can be done to prevent a recurrence, or correct the situation. (USE ADDITIONAL PAPER IF NEEDED)

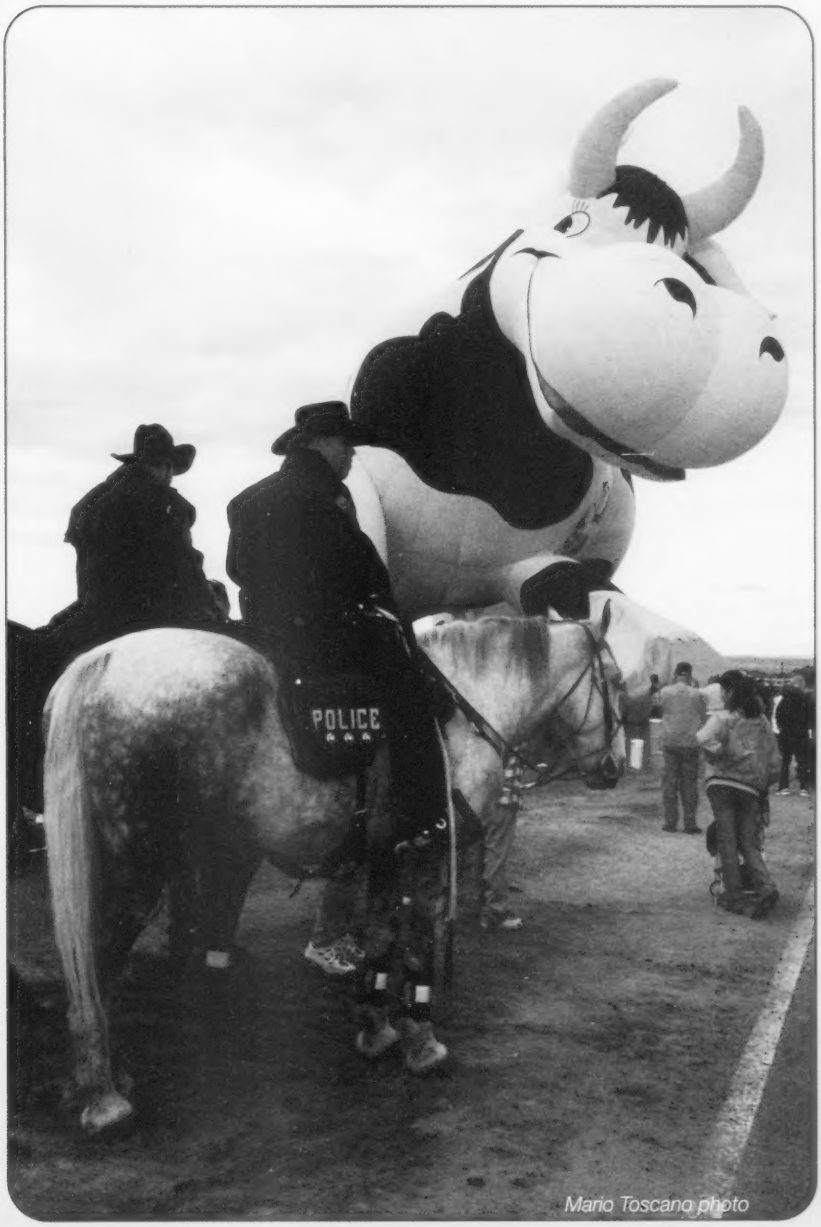
CHAIN OF EVENTS
- How the problem arose
- How it was discovered
- Contributing factors
- Corrective actions

HUMAN PERFORMANCE CONSIDERATIONS
- Perceptions, judgments, decisions
- Actions or inactions
- Factors affecting the quality of human performance

A Little Balloon History

Man's first venture into the air was in a hot air balloon invented by the Montgolfier brothers, papermakers of Annonay, France. The Montgolfier balloon, sponsored by Louis XVI, was flown from the Bois de Boulogne in Paris on November 21, 1783. In attendance were many notables, including Benjamin Franklin. When asked by a skeptic, "Of what use is it?," Ambassador Franklin is reported to have said, "Of what use is a newborn baby?"

Professor Charles, inventor of the gas balloon, was working concurrently with the Montgolfier brothers, and in direct competition for the support of the king. His approach was a balloon filled with newly discovered hydrogen obtained from disassociation of the elements composing water. Professor Charles' creation, the Charliere balloon, flew from the Tuileries on December 1, 1783, and the Space Race was on!



Mario Toscano photo

Within a very few years, a third type of balloon was flown by Pilatre de Rozier, also in France. The Rozier balloon combined hot air and hydrogen; a hydrogen envelope inside a hot air envelope was heated so that less valving and ballasting were necessary to maintain altitude control. This soon proved to be dangerous, and the Roziere-type balloon was forgotten until helium became readily available.

All three types of balloons, or aerostats — the Mongolfiere, Charliere, and Roziere — are in use today. Propane burners have replaced wood, straw, and dung in the hot air, or Mongolfiere balloons. Helium, ammonia, city gas, and hydrogen are the lifting gasses used in gas, or Charliere balloons, while Roziere balloons now use a helium inner envelope, with a surrounding hot air envelope heated by propane.

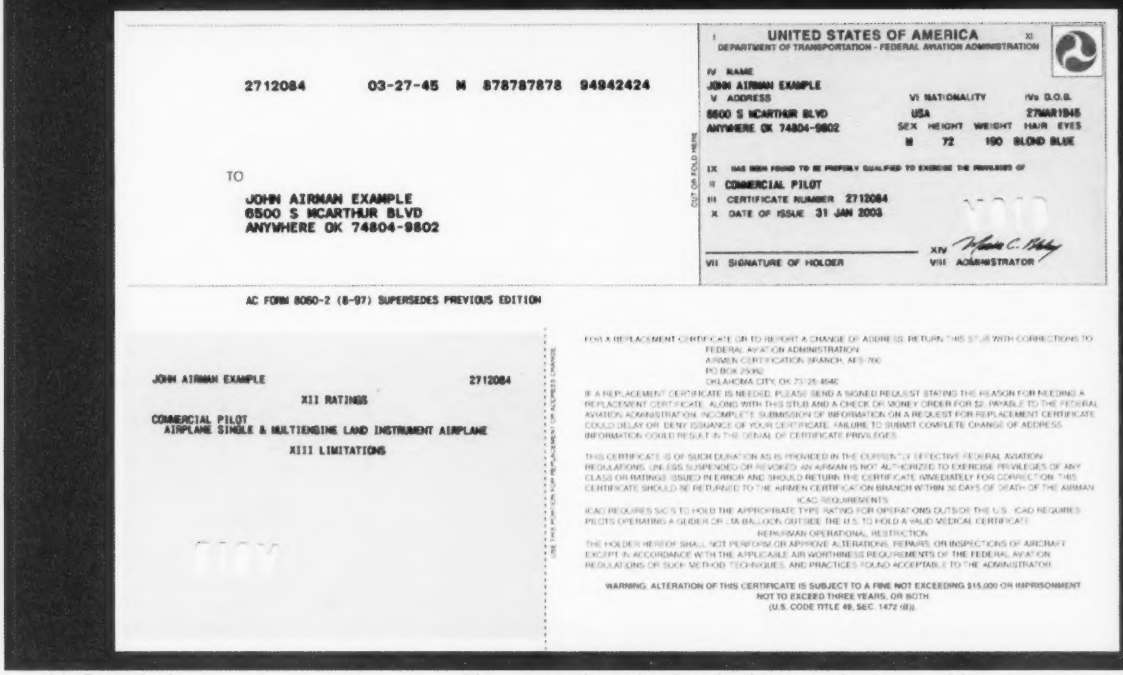
The renaissance of hot air ballooning developed under the guidance of Ed Yost in Sioux Falls, SD, in the early 1960s under a U.S. Navy contract with General Mills. The Yost-General Mills product proved to be more valuable for recreation than for military use, and sport hot air ballooning was reborn. There has since been a steady growth of ballooning in the United States and around the world, and balloons can be seen flying every day. Many flights are in competitive events and rallies. Balloons are also used commercially to give sightseeing rides, and as flying billboards to advertise many products.

For additional information, readers can reference the following books used in preparation of this article:

The Eagle Aloft - Two Centuries of the Balloon in America, Tom D. Crouch, Smithsonian Institution Press, Washington, DC, 1983

Astra Castra, Experiments and Adventures in the Atmosphere, Hatton Tuznor, Chapman and Hall, London, 1865

License or Certificate? *by Frank S. Phillips, Jr.*



2712084 03-27-45 M 878787878 94942424

TO

JOHN AIRMAN EXAMPLE
6500 S MCARTHUR BLVD
ANYWHERE OK 74804-9802

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

IV NAME
JOHN AIRMAN EXAMPLE
V ADDRESS
6500 S MCARTHUR BLVD
ANYWHERE OK 74804-9802

VI NATIONALITY: USA
IVa D.O.B.: 27MAR1945
SEX: M HEIGHT: 72 WEIGHT: 190 HAIR: BLOND EYES: BLUE

IX HAS BEEN FOUND TO BE PROPERLY QUALIFIED TO EXERCISE THE PRIVILEGES OF
II COMMERCIAL PILOT
III CERTIFICATE NUMBER 2712084
X DATE OF ISSUE 31 JAN 2003

VII SIGNATURE OF HOLDER
XIV VIII ADMINISTRATOR

AC FORM 8060-2 (8-97) SUPERSEDES PREVIOUS EDITION

JOHN AIRMAN EXAMPLE 2712084

XII RATINGS

COMMERCIAL PILOT
AIRPLANE SINGLE & MULTIENGINE LAND INSTRUMENT AIRPLANE

XIII LIMITATIONS

FOR A REPLACEMENT CERTIFICATE OR TO REPORT A CHANGE OF ADDRESS, RETURN THIS STUB WITH CORRECTIONS TO:
FEDERAL AVIATION ADMINISTRATION
AIRMEN CERTIFICATION BRANCH, AFS-760
PO BOX 25082
OKLAHOMA CITY, OK 73125-4914

IF A REPLACEMENT CERTIFICATE IS NEEDED, PLEASE SEND A SIGNED REQUEST STATING THE REASON FOR NEEDING A REPLACEMENT CERTIFICATE, ALONG WITH THIS STUB AND A CHECK OR MONEY ORDER FOR $2, PAYABLE TO THE FEDERAL AVIATION ADMINISTRATION. INCOMPLETE SUBMISSION OF INFORMATION ON A REQUEST FOR REPLACEMENT CERTIFICATE COULD DELAY OR DENY ISSUANCE OF YOUR CERTIFICATE. FAILURE TO SUBMIT COMPLETE CHANGE OF ADDRESS INFORMATION COULD RESULT IN THE DENIAL OF CERTIFICATE PRIVILEGES.

THIS CERTIFICATE IS OF SUCH DURATION AS IS PROVIDED IN THE CURRENTLY EFFECTIVE FEDERAL AVIATION REGULATIONS, UNLESS SUSPENDED OR REVOKED. AN AIRMAN IS NOT AUTHORIZED TO EXERCISE PRIVILEGES OF ANY CLASS OR RATING ISSUED IN ERROR AND SHOULD RETURN THE CERTIFICATE IMMEDIATELY FOR CORRECTION. THIS CERTIFICATE SHOULD BE RETURNED TO THE AIRMEN CERTIFICATION BRANCH WITHIN 30 DAYS OF DEATH OF THE AIRMAN.

ICAO REQUIREMENTS

ICAO REQUIRES SIC'S TO HOLD THE APPROPRIATE TYPE RATING FOR OPERATIONS OUTSIDE THE U.S. ICAO REQUIRES PILOTS OPERATING A GLIDER OR LTA BALLOON OUTSIDE THE U.S. TO HOLD A VALID MEDICAL CERTIFICATE.

REPAIRMAN OPERATIONAL RESTRICTION

THE HOLDER HEREOF SHALL NOT PERFORM OR APPROVE ALTERATIONS, REPAIRS OR INSPECTIONS OF AIRCRAFT EXCEPT IN ACCORDANCE WITH THE APPLICABLE AIR WORTHINESS REQUIREMENTS OF THE FEDERAL AVIATION REGULATIONS OR SUCH METHOD, TECHNIQUES, AND PRACTICES FOUND ACCEPTABLE TO THE ADMINISTRATOR.

WARNING: ALTERATION OF THIS CERTIFICATE IS SUBJECT TO A FINE NOT EXCEEDING $15,000 OR IMPRISONMENT NOT TO EXCEED THREE YEARS, OR BOTH (U.S. CODE TITLE 49, SEC. 1472 (d)).

It's Saturday!

The weather is beautiful! You're at the airport. Where else would you be?

You hear a voice. It's barely audible. You look, but no one's there. Again, you hear the voice. You look down and see the admiring, youthful eyes of a small girl, no more than five years old.

She asks, "Are you a pilot?"

Of course you are. You puff up with pride and respond, "Yes, I am licensed to fly."

Another voice bellows from behind you. This one is loud and authoritative, "It's a certificate! It is not a license!"

You turn to see a set of piercing, penetrating eyes. It is the voice of the all-knowing local FAA Aviation Safety Inspector who has the eyes of experience, no less than a hundred years of aviation experience. Or what appears to be at least one hundred years of aviation experience, embodying the combined years of Orville's, Wilbur's, Bessie's, Charles', Amelia's, and Chuck's legendary experience rolled into one person.

The Inspector snarls with a rhetorical resonance, "How many times do I have to tell you pilots? It is not a license! It is a certificate!"

You respond meekly, barely above a whisper, "It is a license to fly."

The Inspector growls, "What did you say?"

You sigh, almost in relief that the Inspector did not hear your words. This time you raise your voice and say, "It's a ... er ... ah." You pause, and, then blurt out, "It is a license! Everyone calls it a license. Newspaper reporters, TV announcers, everyone always calls a person who flies a licensed pilot."

The Inspector roars back, "So what! It is not a license! The FARs don't call it a license! The FARs say it is a certificate. Are you questioning the FARs?"

You gulp. You try to answer. You ask yourself is the Inspector correct? Or are you? Are you licensed to fly? Or are you a certificated pilot? Is that piece of paper in your wallet a license, or is it a certificate?

The Inspector used that magic word, "FARs." Whenever questions about aviation regulation arise at the airport, someone always says, "Let's look at the FARs." Another will pull out that familiar, big thick white book with those big, bold letters spelling out "FAR" and begin to flip through the pages. A pronouncement always follows, to which everyone present will nod his or her heads in reverent agreement, saying, "The FARs have spoken!"

We all call the aviation regulations issued by the Federal Aviation Administration FARs, but the correct term is Code of Federal Regulations (CFRs). The aviation regulations are actually one set of many series of regulations that make up the Code of Federal Regulations.

You reach in your ever-ready pilot bag where you have the three bound volumes of Title 14 of the CFR, the first contains parts 1 to 59; the second, parts 60 to 139; and the third parts 140 to 199.

You muster up your courage and say to the Inspector, "Where in the Code of Federal Regulations does it say that I do not have a license to fly?"

The Inspector simply stares at you and says, "Huh?"

You pull out the first volume, select Part One "Definitions and Analysis," hand it to the Inspector, and ask, "Where in Part 1 is `certificate' defined?"

The Inspector skims rapidly through the listed words and begrudgingly admits, "Part 1 doesn't have a definition for certificate."

Your courage rises, "Does it have one for `license?'"

The Inspector looks again and dryly concedes, "Nope," but quickly adds, "we should have looked in Part 61."

You grab the second volume from your bag, and temper your words so that they fall just short of an official inquiry, "Here's Part 61. Section 61.1 is titled, Applicability and definitions. That should have it."

The Inspector scours § 61.1, and again acknowledges, "There isn't a definition here for a certificate or license either. But, look in Section 61.3. It says you may not act as pilot in command of a civil aircraft unless you have a valid pilot certificate in your personal possession or readily accessible. See, it is a certificate! The only mention of a license is the statement is regarding a foreign 'pilot license issued by the country in which the aircraft is operated may be used.'"

Growing bolder, you stand your ground and assert, "It only says you must have a pilot certificate in your possession when you fly. It doesn't say it is a certificate to fly."

The Inspector, stumped by your declaration, utters a one word response, "What?"

You continue, ever more confident, "A pilot certificate is a license to fly. The dictionary says a license is permission to do something authorized by law. It also says that a certificate is a written document certifying that I have met certain requirements. The FAA issues me a pilot certificate to certify that I am licensed to fly."

The Inspector retorts, "We're talking about what the FARs say, not what Noah Webster ... "

You interrupt, "It's the CFRs and the CFRs don't say anything about what a certificate is, but the law does. It, like the dictionary, states that the Administrator shall issue a certificate to an individual who is qualified to perform the duties authorized by the certificate."

"What law?"

You now respond emphatically with the authority, but not the volume, with which you were first addressed, "I was talking about the U.S. Transportation law. I specifically cited what section 44703 of Title 49 of the United States Code states." You quickly add, "And that is the law!"

The Inspector makes a muted grunt, "Hmmph! Well, it's FAA policy! Wait a minute."

The Inspector walks to a nearby FAA car and pulls out an enormous set of binders, entitled FAA Order 8700.1, otherwise known as the, "General Aviation Inspector's Handbook." You gape at what must be at least six inches of paper. You think to yourself, "No wonder those Inspectors seem to have all the answers.

The Inspector says, "The answer is here. I know it is. It has to be in there."

You gulp again as you see the first page. It says, `This handbook provides guidance for general aviation inspectors responsible for certification, technical administration, and surveillance in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) parts 61, 91, 103, 125, 133, 137, 141, 142, and 143.' All of a sudden the wind, which billowed your sails, seems to have suddenly died, to a dead calm.

The Inspector turns to Volume 2, "14 CFR 61 Certification of Pilots and Flight Instructors," and says, "Ah, here it is."

You ask, "What does say?"

The Inspector's waves a hand to signal patience, and says, "Just wait. I'll find it."

The Inspector places a finger on the first paragraph. The finger then follows the words carefully, then moves to the next paragraph and the next, and then page after page. Pages turn slowly at first, then faster and faster, followed by chapter after chapter. Finally the Inspector stops at Chapter 26. You really gulp this time, and say to yourself, "Ooops!" The Chapter is titled, "Conduct a Reexamination Test of an Airman under Title 49 of the United States Code." "Oh, no, what have I gotten myself into?"

The Inspector reads aloud the first sentence of paragraph seven of the chapter, "'When an inspector has sufficient reason to believe that an airman may not be qualified to exercise the privileges of a particular certificate or rating, a reexamination may be required.' That's the FAA's policy. The Order says it plain and clear, `privileges of a particular certificate.' The certificate gives you flight privileges."

You nod your head in agreement, "You're right," and add, "a pilot certificate does give a pilot the privilege to fly." You smile, turn to the small girl, and proclaim with poetic license, "Yes, I am pilot and I'm privileged to fly!"

+

Frank Phillips is a recently retired FAA Aviation Safety Inspector and also a lawyer (bet you couldn't tell from his article).

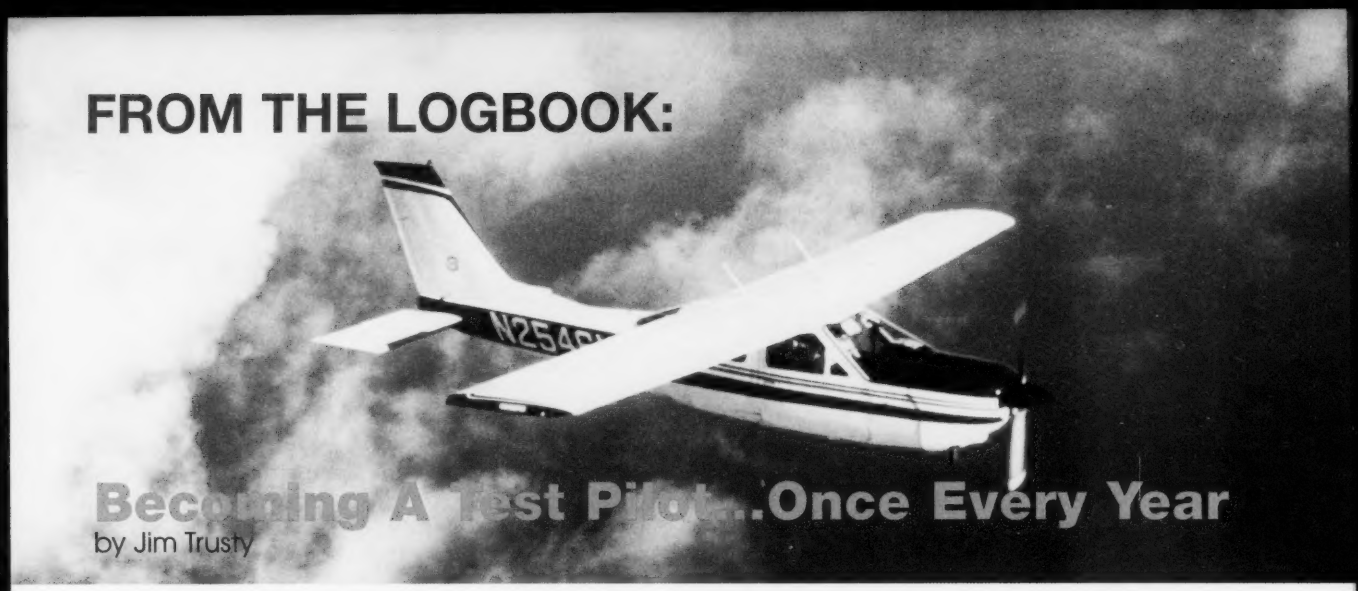
Black's Law Dictionary defines:

Certificate - A document certifying that one has fulfilled the requirements of and may practice in a field.

License – Permission to do a particular thing, to exercise a certain privilege or to carry on a particular business or to pursue a certain occupation. Certificate or the document itself which gives permission.

Privilege – A particular and peculiar benefit or advantage enjoyed by a person ... beyond the common advantages of other citizens.

FROM THE LOGBOOK:



Becoming A Test Pilot...Once Every Year

by Jim Trusty

Is it time for an annual inspection? Ever dream of being a Test Pilot?

The first flight after the annual inspection of your airplane can either be totally uneventful or a very busy flight. I have known and trusted my mechanic for years, and he seldom misses anything. This is good because live, happy, and satisfied pilot/customers can recommend you to others and then return the next time to spend more money. Even so, you should always expect the worst and be prepared. Just think about this statement while I use my case as an example.

Four strangers to my aircraft checked, filled, turned, tightened, touched, replaced, repaired, removed, looked, pondered, and evaluated over 100 items on a factory inspection checklist and then complied with the latest Airworthiness Directives from problems encountered in the last year or so with its make and model. Two of these young men were A&P trainees with absolutely no experience as mechanics.

Some things that fellow pilots have experienced over the years as they left from the annual include, but are not limited to, the following: engine oil not refilled, rags left in gear door wells, fuses pulled, battery disconnected, spark plugs left out on one side, screws not replaced in cowling cover, brakes not bled, fuel turned off, hydraulic fluid not refilled, gear handle in the UP position while the gear is actually DOWN, and tools left on the engine, in the floor under the cabin, and under the seats and carpets.

I might also add that no pilots were injured, crashed, or died because of the foregoing list of mistakes. And in testimony to the hard work that our mechanics do, I really feel that it is impossible to do what they do and combine that with what we do to the airplane during the year and not have an adventure occasionally. But we should be apprehensive...RIGHT?

If they tell you about a problem area that required parts, time, and research and that they think the problem was caught just in time, then you have been forewarned to watch that area much more closely than you normally would. Some would argue that the A&P should be required to fly the aircraft before they release it back to the owner and even others would say that makes as much sense as having the owner participate in the actual work of doing the annual inspection. NO THANKS!

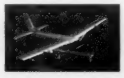
As a flight instructor who does an awful lot of proficiency training, flight reviews, and transition work on complex/high performance aircraft, I have found that pilots who DO NOT fly on a regular basis are generally not as ready as they should be to react to an "unexpected happening" in the air. When I review emergency procedures (such as gear, radio, and vacuum failures and add fuel transfer mistakes), I find that most pilots are not as well versed in recovery procedures as they should be.

This is clearly the fault of the pilot. We get a little complacent and start comparing flying with driving and mistakenly think if something goes wrong that we will have plenty of time to just pull over to the side of the sky and call someone to come fix it. WRONG! I never cease to be amazed when reading accident reports from the NTSB and others just how much of a role pilots often play in what happened and how with just a normal amount of specific training the entire thing could have turned out differently.

Careful selection of a mechanic based on known skill levels for your particular aircraft will not keep something from happening, but it certainly couldn't hurt. Do not make the mistake many pilots make of mechanic selection based solely on the cost of the annual. This is certainly inviting trouble. Bring a squawk list with you and explain the items included. Work with them, especially since it is to your benefit.

The list of people hurt and/or killed in aviation accidents does not have to include your name. You really have a choice in this decision. Is it time for an annual inspection? Ever dream of being a Test Pilot? Let's be careful up there.

Jim Trusty was the FAA/Aviation Industry National Flight Instructor of the Year (1997) and still works full-time as a pilot/flight instructor at MQY in Tennessee.



MEDICAL Stuff

Living and Flying "Over Gross" How to Jettison Fat

by Glenn R. Stoutt, Jr., M.D.

'The time has come,' the Walrus said, 'to talk of many things...' —From Lewis Carroll's The Walrus and the Carpenter

This just might be the time to decide to lose some weight, especially since summer is coming, and bathing suits and shorts show it like it is. There is no problem with motivation. Take just about any three people you see: The odds are that one needs to lose weight and one is obese.

Lifting the Fog

Motivation books are really worthless because anyone who buys one is already motivated. The problem is self-discipline.

The search for the easy fix leads to myriad diets and resolutions to lose weight. Diet-book writers dance on the table and promote erroneous and dangerous fads that sell, and sell and sell. Millions spend millions of dollars to join the dog-and-pony shows in a burst of enthusiasm and do lose weight fast.

But, the point is not to lose weight but to lose fat. You can easily lose twenty pounds of weight in two weeks. First goes the glycogen (sugar) in your liver, then goes water, and finally muscle protein is burned. The immutable law of metabolism is that 3,500 calories must be burned to lose a pound of fat.

All miracle diets—when studied carefully—are actually low-calorie diets. Eventually, after a few months or so you either become sick of the diet, or become sick physiologically.

"I can't lose weight." "I have a very low metabolism." "It's hereditary—everyone in my family is fat." "My thyroid is not working right." "I have cellulite all over." These are excuses, not reasons.

Think of this: If the person dearest to you would die if you did not lose fat (in a reasonable time) it's inconceivable that you would not do so. Self-discipline would then take care of the fat. So, the argument that you cannot lose fat is not valid.

Diets

A psychological barrier with most diets is that they emphasize what you cannot eat—they accentuate the negative. Here is a positive, foolproof way to eat properly and still never go hungry. No one should ever go on a diet. Instead, learn to eat properly. Stay on this list of foods until you get to your desired weight. Plan on losing a pound a week (see table, on page 18).

Until you have attained your goal, if a food is on this list, eat it. If not, don't.

There is absolutely no way to avoid losing fat if you eat only these foods. And, you will not lose an ounce of muscle.

Forget that there is such a word as "diet."

Scales

Stop weighing yourself. How do your clothes fit? How do you look unclothed in the mirror? Scales tell nothing but how much you weigh.

Patience

Be patient. Losing 50 pounds of fat might take as much as a year. But, it probably took over a year to accumulate the pounds. New clothes do not become snug or tight in just a few months. If just your pants or skirt are too tight, even a few weeks of proper eating will accomplish wonders—for your appearance and mood.

Snacks

A snack at mid-morning, mid-afternoon, and late evening will keep any hunger away. Six small meals are always much better than the three regular ones we are accustomed to.

Meats

Choose one: fish, chicken, turkey, or beef once a day. Not all four.

Exercise

Regular exercise is absolutely necessary. A rule of thumb for fat loss: about 80% from diet and 20% from exercise. Both are essential.

Balance

When you attain your desired body proportions (not just weight), relax a bit down to the Rule of 80/20. Eat in moderation about 80 percent of the time, and enjoy what you like to eat (again, reasonably) the other 20 percent of the time. You don't have to give up the pleasures of foods you really like.

Moderate

Self-discipline is the key to attaining and keeping your optimum body fat all your life.

No use being a zealot. A couple of teaspoons of sugar on your morning oatmeal or cereal, and beans or greens cooked in a small amount of bacon or ham won't wreck your routine. Eat just about anything you want or crave (reasonable amounts) for one meal a week. Life without pizza on the weekend would be unendurable for some people. One alcoholic beverage (a beer, glass of wine, or a drink) once a week at mealtime is fine. Any eating plan will fail if it is too rigid.

Size

You have nothing to lose but fat, and some sizes in your belt and clothes.

Timing

Is this your time for blubber elimination? King Solomon wrote of the proper time for everything under the sun: a time to sow and a time to reap, a time to live and a time to die—and so on. No one will decide to lose fat (or stop being an alcoholic) until the proper time is reached—for him or her. For people who are tortured by being overweight, the time just might be right now.

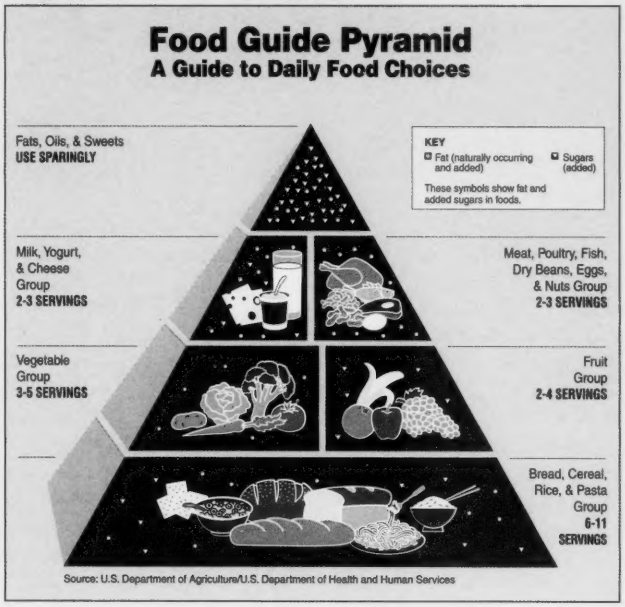
Yours for good health and safe flying

Dr. Stoutt is a partner in the Springs Pediatrics and Aviation Medicine Clinic, Louisville, Ky., and he has been an active AME since 1960. No longer an active pilot, he holds a commercial pilot's certificate with instrument, multi-engine, and CFI ratings.

Note: This article appeared in the Summer 2002 Federal Air Surgeon's Medical Bulletin. *The views and recommendations made in this article are those of the author and not necessarily those of the Federal Aviation Administration.*

The Best of the Best Foods

Feature them in your foolproof eating plan


Food Guide Pyramid
A Guide to Daily Food Choices
Fats, Oils, & Sweets
USE SPARINGLY
KEY
Fat (naturally occurring and added)
Sugars (added)
These symbols show fat and added sugars in foods.
Milk, Yogurt, & Cheese Group
2-3 SERVINGS
Meat, Poultry, Fish, Dry Beans, Eggs, & Nuts Group
2-3 SERVINGS
Vegetable Group
3-5 SERVINGS
Fruit Group
2-4 SERVINGS
Bread, Cereal, Rice, & Pasta Group
6-11 SERVINGS
Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services

All-bran cereals
Apples
Asparagus
Bananas
Beans
Beef (lean cut)
4 oz. per day
Beets
Berries
Bread (whole-grain)
1-3 slices a day
Broccoli
Brussels sprouts
Buttermilk (low-fat)
Cabbage
Cantaloupe
Cauliflower
Celery
Chicken breast (no skin, broiled or baked)
4 oz. per day
Collard greens
Condiments (just about any that don't have a lot of fat, sugar, or salt)
Cottage cheese (low-fat or no-fat)
Cream (fat-free sour cream)
Cucumbers
Eggs 1-2 a day if your cholesterol is OK. (hard-boiled or poached)
Fish (cod is great)-not fried!
Kale
Lettuce
Margarine (no fat)
Milk (skim, no-fat)
Mushrooms
Mustard greens
Nuts (handful a day at most)
Oatmeal
Olive oil (moderate amounts for salads and flavoring)
Onions
Oranges
Pears
Peas
Peppers, green or red
Pickles
Pineapple
Popcorn, unsalted and unbuttered
Pork (lean) 4 oz. per day
Potatoes (Irish or sweet, with skin)
one big or two small
Radishes
Rice (brown or wild)
Salad dressing (no-fat)
Salsa
Soft drinks (no sugar)
Soy products (tofu, etc.)
Spinach
Squash
Sugar substitutes (Aspartame and Saccharine)
Tomatoes
Turkey breast (no skin, broiled or baked)
4 oz. per day
Turnips greens
Turnips
Yams
Yogurt (plain, unsweetened)
Zucchini

Sun 'n Fun® 2003

Story and photos by H. Dean Chamberlain

As we have been saying for years, if you like aircraft, friendly people, knowledgeable experts, and sunshine, the place to be from April 2 to 8 is in Lakeland, Florida, or, more specifically, you need to be at the southwest corner of Lakeland's Linder Regional Airport (LAL). The airport is the home of the annual Sun 'n Fun EAA Fly-In®, its year-round headquarters, and museum. If you have never been to Sun 'n Fun®, it is the second largest air show and fly-in in the country. Only the Experimental Aircraft Association's (EAA) AirVenture in Oshkosh, Wisconsin, is larger. The best way to find Lakeland on a map or chart is to look for it along Interstate 4 between Tampa and Orlando.

Because of Sun 'n Fun®'s size with its hundreds of thousand of people, thousands of aircraft, number of days, and size of its air show, each year FAA issues a Special Traffic Management Program (STMP) Notice to Airmen (NOTAM) for the event. This year's NOTAM is effective from 0700 to 2000 local time from March 31 through April 8. Please note the NOTAM's effective date is before the public opening of Sun 'n Fun®.

This article highlights some of the safety information pilots need to be aware of flying to Sun 'n Fun® and through nearby airspace. This article only highlights selective information. If you plan on flying in the Lakeland and central Florida areas during this period, you need to read the complete NOTAM to make sure you comply with the special procedures outlined in the NOTAM. It is important to note that both the Tampa and Orlando Class B airspaces are only a short flight distance from Lakeland. Remember not to enter Class B airspace without ATC authorization. The NOTAM contains special information about flying through the Class B Mode C Veils. Linder Regional Airport is within Class D airspace.

The complete NOTAM is scheduled for publication in the February 20, 2003, *Notices to Airmen*. At that time, the information will also be available electronically on the FAA's Internet site at <http://www.faa.gov/NTAP>. The Sun 'n Fun®'s Web site is <http://www.sun-n-fun.org>. The Orlando Flight Standards District Office's Internet site also has Sun 'n Fun® information. The FSDO's URL is http://www.faa.gov/fsdo/orl.

SUN 'N FUN® INTERNET WEB SITE SUPPORT FOR VISITORS

The Sun 'n Fun® Web site also has driving instructions to the airport, available transportation, local tourist and lodging information, an area airport directory listing available services, plus more information about the fly-in, and other aviation information.

FAA SAFETY CENTER

The FAA Safety Center is the home of the "Meet the FAA" session; safety presentations by industry ex-

perts and FAA safety inspectors; and FAA exhibits sponsored by various FAA organizations. Included in this article is the schedule for the safety presentations. Please check the daily listing at the Safety Center to confirm a scheduled presentation since the schedule is subject to change. One of the most popular sessions is Meet the FAA. Senior FAA managers from Washington Headquarters are normally on hand to answer questions from the audience.

For those unable to attend a specific session, all or part of the sessions will be broadcast on the local Sun 'n Fun® Radio on 1510 am. This low-power broadcast service normally covers the grounds of Sun 'n Fun" and the surrounding area. Tune in to check for coverage in your specific area.

The Orlando Flight Standards District Office (FSDO) will have representatives available at the Safety Center to answer questions and help anyone who may have an issue requiring a safety inspector's help. The FAA Safety Center opens at 8 a.m. (local).

FAA SAFETY CENTER'S TEMPORARY FLIGHT SERVICE STATION

In addition, a temporary non-automated Lakeland Flight Service Station (TFSS) will be operating in the FAA Safety Center's building during the fly-in. The TFSS's hours are 0600-1900 (local) from April 1 through 8. The TFSS provides weather briefings, flight plan services, and flight planning information needed for operating to and from Lakeland during the fly-in.

Complete flight services are available from the St. Petersburg Automated Flight Service Station by telephone at 1-800-992-7433 (1-800-WX-BRIEF).

Please note the special instructions in the NOTAM about air filing and canceling of flight plans.

SPECIAL AIR TRAFFIC MANAGEMENT PROGRAM NOTAM

As we say each year, finding yourself number 10 in trail in the special Lake Parker Arrival Procedure to enter the traffic pattern for landing is not the time to wonder what is going to happen next. The NOTAM outlines the special holding procedures to be used at Lake Parker and other sites if holding is required at Lakeland.

Pilots are reminded to always fly in trail. Side-by-side separation is not permitted. Pilots need to be ready to fly closer to more aircraft in flight than

they ever thought possible.

Although the SATMP arrival and departure procedures are not complicated, they do need to be understood very well. The procedures are designed to move hundreds of different types of aircraft safely, quickly, and predictably in and out of Lakeland by having both pilots and controllers follow the same published procedures. Knowing and following the published procedures are especially important in the case of an emergency at Lakeland or one of the outlying airports.

All pilots need to review and comply with all of the provisions of the NOTAM to try and avoid any incident or security breach that might negatively impact general aviation.

Pilots need to remember that special, reduced arrival and departure separation standards are in effect during this period.

LANDING PROCEDURES

VFR aircraft and IFR aircraft when the ceiling and visibility at Lakeland is reported at or above 3,000 feet and five miles visibility can expect to follow the standard VFR Sun n' Fun® Lake Parker Arrival Procedure to the airport. Small general aviation VFR traffic can expect to land on what is normally a taxiway at Lakeland Linden Regional Airport. As noted in the NOTAM, two aircraft at a time may be landing on that taxiway redesignated as Runway 9L and 27R during this period. The width of this temporary runway is 75 feet.

As shown in the NOTAM, Runways 9L and 9R have displaced thresholds. Temporary Runway 9L will also have two designated touchdown points marked by signs in addition to its strobe-marked displaced threshold area. Aircraft landing on Runway 9L will be told to land either at the threshold, or one of the two designated touchdown points: spot 1 or spot 2. This is how three aircraft may be landing on Runway 9L at the same time, so it is important that all three aircraft know and follow the correct landing procedure.

Aircraft are not to land on the main, wide runway 9R and 27L unless specifically instructed by the control tower.

The NOTAM includes closed runway and changed instrument procedures.

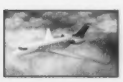
All landing pilots are advised to watch for possible wave-offs signals by radio, RED smoke, or by hand signals from the red-shirted air traffic controllers located near the approach end of the runway in use.

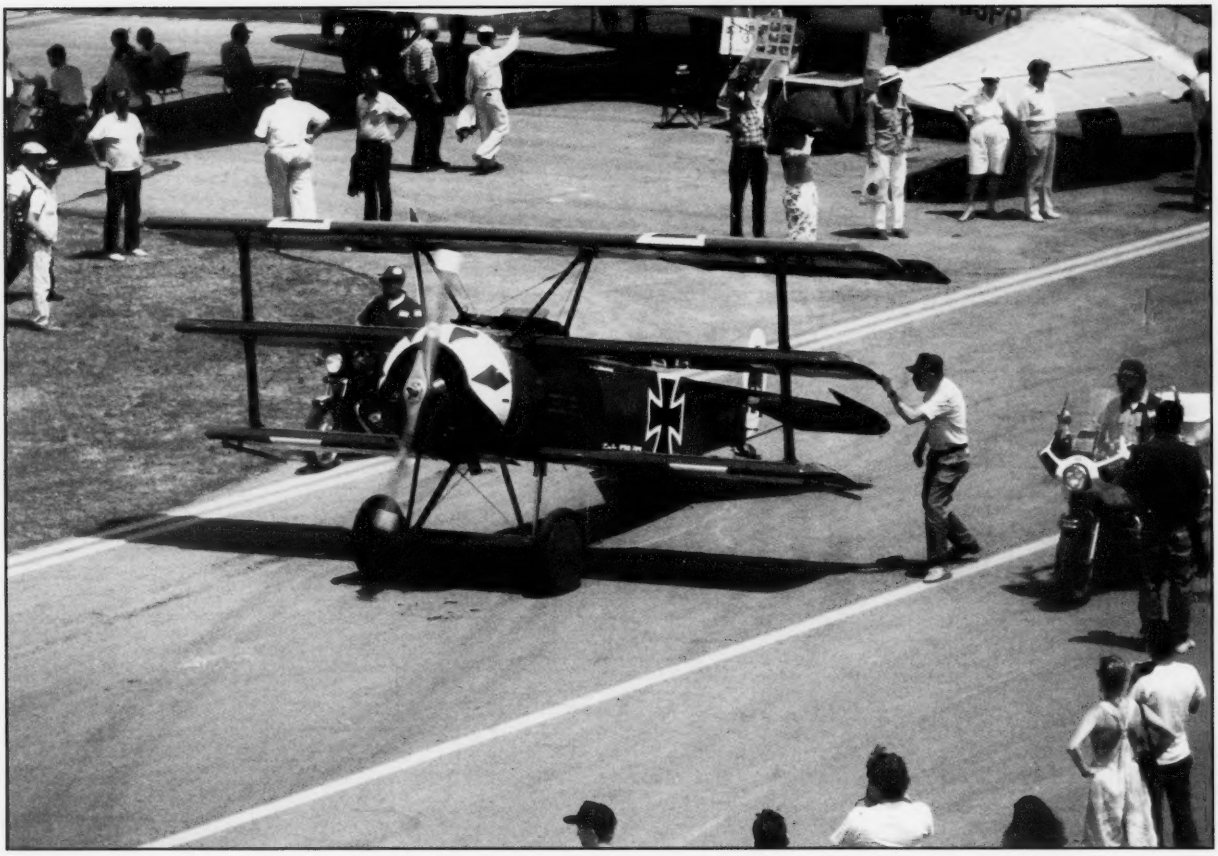
Once an aircraft has landed, pilots are expected to clear the runway as soon as possible onto a hard surface.

The NOTAM contains detailed instructions on landing and taxiing procedures for all types of aircraft as well as the use of special cockpit parking signs.

RADIO PROCEDURES

There is a limited use of radio communications to control aircraft landing or departing Lakeland. The NOTAM outlines when pilots should





communicate and when they should just monitor their radios. Strict compliance with the published communication procedures will avoid any unnecessary frequency congestion while speeding up the landing or departure process.

Pilots just have to remember their aircraft type and color. While monitoring the appropriate frequency, you might hear something like this, "Red and White biplane, rock your wings for identification. Now, follow the aircraft in front of you to the airport."

AFTER LANDING

Landing pilots need to clear the runway as soon as possible onto a hard surface. The need to expedite traffic is why everyone needs to review the operating procedures outlined in the NOTAM. It is important that aircraft remain on a hard surface unless specifically directed by the tower or flagman to do otherwise.

As the NOTAM states, "Expeditious clearing of the runway is ABSOLUTELY ESSENTIAL because of continuous arriving and departing aircraft behind you."

EAA ground personnel on the south side of Runway 9R/27L will direct aircraft to parking. Flashing arrows are also used to indicate taxi route.

AIRCRAFT SIGNS

To expedite aircraft parking, the NOTAM asks pilots to make a light colored sign with large dark lettering that is readable from 50 away feet with the appropriate code for your desired parking area. The NOTAM lists seven coded parking areas.

RADIO AND NO-RADIO PROCEDURES

Pilots are asked to comply with the radio procedures outlined in the NOTAM, but every pilot should contact ATC immediately if there is any question of safety of flight or in case of an emergency.

Pilots should remember some of the aircraft flying to and from Lakeland don't have radios.

The NOTAM outlines the procedure for no-radio aircraft operations into and out of Lakeland. If your aircraft is not radio equipped, you will need special authorization to operate from 0700 to 1900 hours local from April 1-8. The NOTAM explains how to request authorization.

AIRSPACE

VFR pilots should pay particular attention to the airspace information given because of the proximity of the Tampa and Orlando Class B airspaces. The NOTAM explains how to transit the Class B veils without a transponder.

VFR pilots must request and re-

ceive permission to enter Class B airspace.

WAYS TO MINIMIZE RISK OF MIDAIR COLLISION

The recent midair collision in Colorado highlights the need for all pilots to pay extra attention for possible conflicting traffic as they approach the Lakeland area. Since there is such a performance mix among the thousands of different types of aircraft flying to, through, or in the Lakeland area during this period, there is an increased chance of a mid-air collision risk. One way to reduce that risk is to fly with your landing lights and beacon or strobe lights on within 30 miles of Lakeland. Pilots should also monitor the appropriate ATC frequencies listed in the NOTAM when flying within the central Florida area.

Pilots should expect the unexpected because some pilots will fail to read the NOTAM, some will forget what they have read, and some will simply do something dumb.

Because of the traffic volume flying into and out of Lakeland, "...student pilot training flights are highly discouraged during this event. This includes student solo cross country flights, touch-and-go-landings, low approaches, and practice instrument approaches."

The key to your flight safety is to keep your eyes open and be prepared to react to the unexpected.

ELT MONITORING EN ROUTE

Pilots flying to and from Lakeland should periodically monitor 121.5 MHz on their radio en route to check for any activated emergency locator transmitters (ELT) that might be reporting an aircraft accident. If you detect an ELT signal, contact the nearest air traffic control facility with the information.

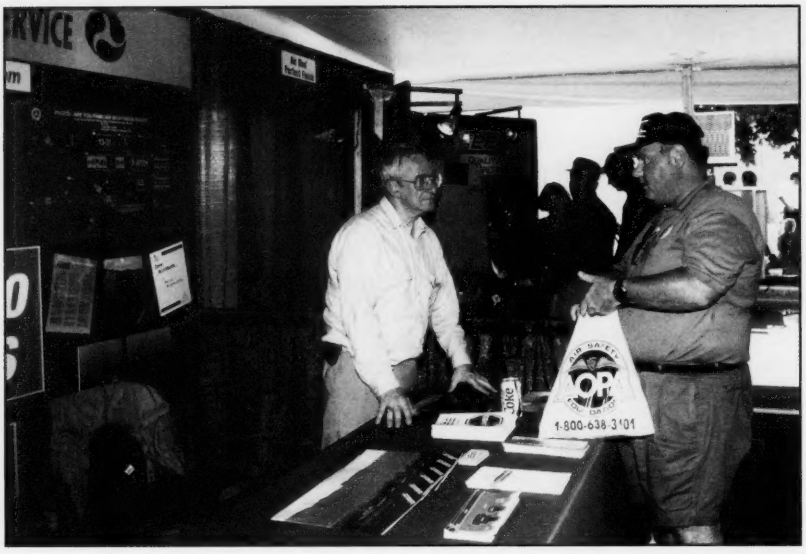
EXTRA FUEL

Because of the potential delay with so many aircraft operating at Lakeland, including the risk of an accident on the field which might close the airport for a while, all pilots should make sure they have enough extra fuel on board for the flight including the appropriate IFR or VFR minimums plus enough fuel for an in-flight hold of at least 30 minutes or more. Just stay within your approved weight and balance limitations.

You may want to have an alternate plan and destination in mind in case you can't get into Lakeland.

FLIGHT PLANS

Pilots on VFR flight plans are asked to extend their estimated time of arrival by 30 minutes to compen-



sate for any unexpected traffic delays.

VFR pilots are asked to include their aircraft's color in the remarks section of their flight plan.

All pilots (IFR AND VFR) should review the special flight plan filing and closing procedures in the NOTAM.

IFR PROCEDURES

There are special IFR procedures during this period for both IFR traffic going into and departing Lakeland as well as special procedures for southbound IFR traffic crossing Charleston (CHS) via V1.

An IFR slot reservation is required during this period for all domestic nonscheduled IFR arrivals and departures to or from the Lakeland Linder Regional Airport (LAL), Plant City Municipal Airport (PCM), Bartow Municipal Airport (BOW), Lake Wales Municipal Airport (X07), and Winter Haven Gilbert Airport (GIF). The NOTAM tells how IFR pilots can request an arrival or departure slot to or from these airports. Slots can be reserved starting at 0700 EDT (1100 UTC) Friday, March 28. Reservations will not be assigned more than 72 hours in advance.

Flight plans filed in the air and changes of destination from airborne flights to the above airports will not be accepted except in emergency situations.

IFR pilots need to review the VFR Sun 'n Fun-Lake Parker Arrival and Departure Procedures because they may have to discontinue their IFR approach and enter a VFR traffic pattern for landing when conditions permit.

VFR PROCEDURES

Inbound VFR flights are asked to close their flight plans in flight before landing because of possible delays in getting to parking in time to close their flight plans.

SAFETY NOTES

Because of the mix of traffic, all pilots might want to practice flying their aircraft at its ***minimum safe, the operative word is SAFE airspeed***, before arriving at Lakeland. You should be able to control your aircraft safely at its slowest, normal cruise, and at a speed faster than normal cruise. The reason is you may be mixed in with other aircraft that may be flying slower or faster than you might normally fly. You may also need to be able to maintain your place in trail of other aircraft. ***But as the NOTAM states, if you cannot safely reduce airspeed to follow slower traffic, inform ATC and do not, we repeat do not, fly at any airspeed that jeopardizes your safety of flight.***

Pilots should also bring their own tie-down gear and anchors if possible.

You might want to carry a survival kit. The basic survival rule of being dressed and prepared to walk home regardless of the conditions and weather is always a good one. Sun block, shorts, T-shirts, water bottles, and rain gear should round out your Florida "survival" items.

AFTER LANDING ELT CHECK

After landing and before securing your aircraft, all pilots in radio-equipped aircraft should do a final radio check on 121.5 MHz to check for an inadvertent emergency locator transmitter (ELT) activation.

GRASS-FIELD OPERATIONS

If you need a special grass-field operation, you can submit a request for a "Special Grass-Field Authorization and Procedures" by contacting Sun 'n Fun" at the following address. According to the NOTAM, limited grass-field operations can be accommodated.

SUN 'N FUN" EAA FLY-IN INC.

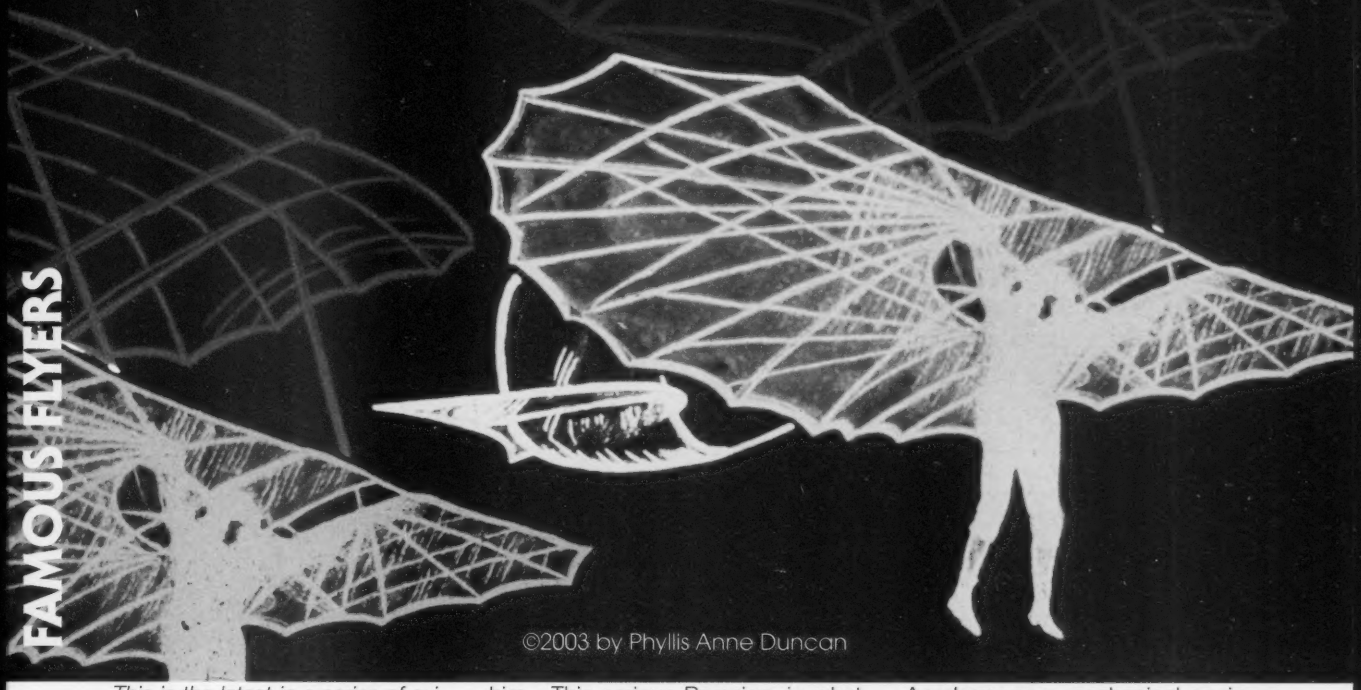
Sun 'n Fun" EAA Fly-In's Internet Web site provides not only the history of the event, but also all of the current information you may need or want to attend the fly-in. Sun 'n Fun's" address is P.O. Box 6750, Lakeland, FL 33807. Its telephone number is (863) 644-2431.

SPECIAL SECURITY ALERT

As this is being written, FAA and the Transportation Security Administration have established a special Air Defense Identification Zone around the Washington-Baltimore area as part of the increased national security alert. Although we have no idea when the alert status will change, we want to remind you to check for any NOTAM that might be issued before, during, and after the Sun 'n Fun" fly-in that would effect your route of flight to and from Lakeland.

To Fly is Everything

The Influence of Otto Lilienthal on the Wright Brothers



©2003 by Phyllis Anne Duncan

This is the latest in a series of aviation historical articles presented to commemorate the Centennial of Flight in 2003. Former FAA Aviation News *Editor, Phyllis Anne Duncan, explores the life and contributions of Otto Lilienthal (1848-1896) and poses the question, "Could the Wright Brothers have done it without him?"*

Otto Lilienthal, sometimes called "The First Airman," was born before Germany became a unified country and died before the end of the 19th century, well before what his time should have been. Seven years after his death, two Americans who had been inspired by his experiments accomplished what his death denied him. This serious Prussian, in what was considered a frivolous endeavor in his time, and these two bicycle mechanics from Ohio were trying to achieve the same thing—powered flight. The latter succeeded where Lilienthal could be said to have failed, but in some ways the Wright Brothers might never have succeeded if Otto Lilienthal had not flown gliders before them.

Barely a century after the Montgolfier brothers first flew in a hot air balloon, aviation was anything except respectable. No mechanical engineer trained in the rigid, but thorough, German technical education system would ever consider aerodynamic theory worthwhile of study. (Lilienthal had graduated from the Berlin Technical Academy as a mechanical engineer and had established his own machine shop when he began his exploration of flight.) There were birds, yes, but that was left to biologists, and the flights of balloons were capricious at best. To decide to study such a pseudo-science would bring only derision and disdain from colleagues. Only a brash, young, and certainly not German fool would bother with such nonsense. Yet, Lilienthal was, by the standard of the time, not a particularly young man when he and his brother, Gustave, not only began to dream about manned flight but began to experiment with various glider designs. Otto was in his early 40's, a decade or more of accepted science and engineering endeavors behind him, when

"But all this is only a means to the end; our aim remains—the developing of human flight to as high a standard as possible. If we can succeed in enticing to the hill the young men who today make use of the bicycle and the boat to strengthen their nerves and muscle, so that, borne by their wings, they may glide through the air, we shall then have directed the development of human flight into a course which leads towards perfection."

From "Practical Experiments for the Development of Human Flight"

By Otto Lilienthal, 1896

he decided to concentrate on flight. His first concepts were only crude drawings and small models of possible shapes and glider configurations, but he started with the basics, much like da Vinci had. He studied birds in flight and the nature of the wind.

Lilienthal had been born near the Baltic Sea, and his childhood "friends" were storks who migrated over the area, stopping to graze the marshes around the Baltic. Possibly it was then that his first fascination with flight occurred. Storks are large, ungainly birds, so large and ungainly that seeing them on the ground makes one wonder how they ever get airborne. Lilienthal watched as a child and brought the flight of birds to mind when he began to explore aerodynamic theory. One thing is known, and that is Otto and his younger brother Gustave built their first flying machine at the tender ages of 14 and 13, respectively. That, apparently, did not get off the ground, but for the next 17 years the two brothers built increasingly more complicated and theoretical flying machines based on birds and insects.

Cautious Approach—Sometimes

"...human flight cannot be brought about by one single invention," Lilienthal wrote in 1896, "but is proceeding towards its perfection by a gradual development." These words introduce his comprehensive treatise, "Practical Experiments for the Development of Human Flight," widely believed to have been only one of several Lilienthal publications to inspire Orville and Wilbur Wright. Lilienthal criticized his precursors who sought to conquer the barrier of manned flight by constructing "flying machines in a complete form, at once capable of solving the problem..." of the lack of physical and technical knowledge about flight. The state of theoretical science about flight, he was saying, was insufficient to overcome "a mechanical task of such magnitude." What was needed, he believed were the "preliminaries," the experiments with wing shapes that would prove the most efficient. Once the experiments settled on a specific design, he concluded that, "One can get a proper insight in the practice of flying only by actual flying experiments."

Lilienthal's first "flying experiments" consisted of leaping off a raised board with facsimiles of birds' wings strapped to his body. That proved to be about as successful as my youthful attempts to fly like Superman, a large bath towel for my cape. However, because he was an engineer, he kept at it until he was successful. That required building a conical hill (Fliegeberg, literally, flying hill) near his home in Stolln (south of Berlin) so that he could get greater height and extend the time that his apparatus allowed him to glide. The man-made hill was 15 meters high (almost 50 feet), and he postulated that one double that height would increase the amount of time one could stay aloft. In the 1880's to run along the ground then jump into the air, held up by a contraption of willow wood and cotton-twill, was truly a leap of faith, especially when one's only attachment to the "sailing apparatus" was one's hands. In truth, the technical and engineering community of the time initially scoffed at Lilienthal's experiments. All he was doing, they proclaimed, was proving the existence of gravity. Anyone who jumped off a 50-foot hill is going to "fly" through the air before hitting the ground.

A Picture Is Worth...

Photography was probably Lilienthal's saving grace. Battlefield photos from the American Civil War and improvements in camera technology had assured photography came into its own in the 1880's, and Lilienthal's soaring had finally attracted attention of the German media. (American papers had been sending reporters to Germany to photograph and write stories about Lilienthal long before he received media attention in his homeland.) Pictures of his flights began to appear in newspapers all over Europe, in magazines of the era, and in scientific publications. That, along with eyewitness reports of the lengths of his flights and his own scientific treatises complete with drawings and formulae, finally convinced the scientific community that his experiments were a great deal more than quasi-controlled plummets to the ground.

Many of those early photographs still exist, and if you do a "Google" search on the Internet for Lilienthal, you can view some of them. You can catch a glimpse, too, of Lilienthal himself, the studious Prussian beard, the warm, flannel shirt, padded knees to his knickers, and sturdy boots for taking the shock of landing. Perhaps from the strength required to hold onto his gliding apparatus, you can see he is every bit the athlete, his hours of soaring written in a set of broad shoulders and a barrel chest. Yet the angles and turns visible in the photos impart another aspect of

Lilienthal as well—he was having fun. He was to describe his flights, especially the ones where he could eke out more distance, as an "indescribable pleasure." It is not only likely, but probable, that some of these incredible photographs were seen by a particular duo of young men in Dayton, Ohio.

Early Safety Analysis

Lilienthal was relentless in his study of air movement and wind, and he recognized quickly what is common knowledge among hang gliders today—a sudden gust of wind can ruin your whole day. So meticulous and thorough was he that, from the time he first designed his sailing apparatus in 1888, he didn't take his first flight until 1891. Before he flew, he published his theories on how man could fly in a book which was widely popular—"Der Vogelflug als Grundlage der Fliegekunst," Birdflight as the Basis of Aviation. This book, published in 1889, consisted of the results of his various experiments with models in both natural wind and a crude wind device. Up to that point, it was all aerodynamic theory, but he was determined to put that theory into practice. That first flight, like most of his flights, was in a large large, mono-wing apparatus. He next experimented with increasing the square footage of the "wings" until the whole thing became too heavy to pick up. He even tried flapping the wings, just like a bird, before he settled on the practicality of "immovable wings." Modern hang glider enthusiasts will also recognize and appreciate what these experiments revealed—he could control his direction of flight by shifting his center of gravity. The design of his mono-winged glider allowed his legs to be free and fully movable, and with practice, all his landings ended standing up.

After a series of experiments to try and develop more lift to soar longer, Lilienthal opted to try bi-wing gliders. He first built small, scale models from heavy paper. Those "aircraft" surprised him with their stability, and he concluded that the full-size gliders would be stable as well and not as susceptible to the irregularities of wind currents. In all, he designed and built 15 different models of mono-wing gliders and three bi-wing gliders,

some vastly different from their predecessors, some only subtly so. There probably would have been a great many more bi-wing gliders except for his death in 1896. Many of the designs seemed whimsical—wings shaped like those of a bat, a triangular tail like some birds, wings that folded back out of the way for storage but with an infrastructure that looked like individual feathers. But they worked, even the ones with the flappable wings. (He didn't launch by flapping those wings; rather, he took his usual leap off Fliegeberg, began to glide, and supplemented that with the occasional flap, just like a bird.)

"So perfectly was the machine fitted together that it was impossible to find a single loose cord or brace, and the cloth was everywhere under such tension that the whole machine rang like a drum when rapped with the knuckles. As it lay on the grass in the bright sunshine, with its 24 square yards of snow white cloth spread before you, you felt as if the flying age was really commencing. Here was a flying machine, not constructed by a crank, to be seen at a county fair at 10 cents a head or to furnish material for encyclopedia articles on aerial navigation, but by an engineer of ability…a machine not made to look at, but to fly with."

Robert W. Wood, Boston Transcript Reporter, describing his first sight of a Lilienthal glider on August 2, 1896

Aeronautical Homework

In a way, Lilienthal's experiments and his scientific writings about them, were the "homework" the Wright Brothers didn't have to do. They didn't have to design their early gliders from scratch because they had Lilienthal's experiments to turn to. Conducted over only five years, Lilienthal's flights numbered in excess of 2,000, and he was meticulous about documenting what did and didn't work and learning from his mistakes. It is believed that from his first glider flight in 1891, he flew every day for the next five years, many of his flights longer than 800 feet.

From those experimental flights, Lilienthal imparted to the Wrights the concepts of wing camber, a stabilizing vertical rudder in addition to a horizontal stabilizer, and a dedicated airfield from which to practice and experiment. Because of Lilienthal's pioneering work, the Wright Brothers could cut to the chase, prove their concept through glider work, then concentrate on combining their design with Charles Taylor's engine. The Wrights also learned the lesson of photography from Lilienthal. Whereas they weren't to become the media darlings that Lilienthal became (not by his design), they recognized the need for their ultimate triumph to be captured on film. That famous photograph, a freeze-frame of history in the making, was indisputable.

Powered Flight—Almost

Lilienthal had experimented with attaching, as he called it, a "dynamo" to an ornithopter design as early as 1893. The carbonic acid, gas motor produced all of two horsepower and was supposed to power the flapping of only the wingtips. Lilienthal decided after assembling it that it wouldn't fly and, indeed, never attempted to test fly it. In 1895 he tried again, this time with a more powerful motor which was supposed to move almost the entire wing. He did try to test fly this configuration without success, and some scientists then and now believe he didn't succedd because he hadn't yet divorced himself from his fascination with bird flight, hence the focus on flapping wings. His experiments with powered airplanes didn't include and his theoretical writings about powered flight didn't involve propellers. Yet, with our perfect 20/20 hindsight many now believe he would have eventually abandoned his reliance on bird flight and come to the inevitable conclusion about propeller-generated thrust. Rather, because he was the engineer he was, he was dedicated to the time-honored trial and error method.

Prussian Hero

Nevertheless, his persistence even in the face of his failures at powered flight made Lilienthal a hero to his people and to aviation enthusiasts, such as they were, around the world, perhaps even to the Wrights themselves. "The Flying Man," "The Winged Prussian," was certainly an inspiration to them and indispensable in their ultimate accomplishment. (However, one German engineer still didn't believe that flight was possible, even given Lilienthal's extensive photographic documentation, and referred to Lilienthal as "The Flying Squirrel.")

Sunday, August 9, 1896, started off as usual at Fliegeberg. The winds were favorable and promised the 48-year old Otto Lilienthal hours of unimpeded gliding. So favorable did the winds appear to be that he opted that day for a mono-wing glider with a new approach to steering—opening and closing slits of cloth on the wings instead of shifting his body weight. (Some birds will "flare" their wingtip feathers to dissipate lift and make those "on a dime" turns. Lilienthal was attempting to duplicate this with a type of wing warping.) The launch was uneventful, but at an altitude of 50 feet, without warning a gust of wind pitched the glider upward. It stalled, and the force up the sudden pitch-up was apparently strong enough to break a section of the wing.

Perhaps he had time to appreciate the irony that despite his vast study of air currents and his many words written about the dangers of sudden gusts, he had been undone by that very thing which still plagues glider airmen today. Lilienthal's broken bird vertically dived to earth, and the impact broke his spine. He lingered for a day, maybe with the knowledge that his injury would deprive him of ever again experiencing the indescribable pleasures of flight, and died.

Typically Teutonic, Lilienthal's most famous quote about his raison d' etre was simultaneously dismissive and passionate: "To invent an airplane is nothing. To build one is something. But to fly is everything."

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Did you know...

...that the Smithsonian's National Air and Space Museum has an original (albeit restored) Lilienthal No. 11 glider, his most successful and popular design which was sold to a few adventurous souls in the 1890's?

...that the only American known to have purchased a Lilienthal glider is William Randolph Hearst, who didn't fly it himself but hired a New Jersey man to do so as a publicity stunt to boost subscriptions to Hearst publications?

...that Lilienthal's exploits inspired the creation of the first glider club in the U.S.?

...that American aviation pioneer Samuel Langley met Lilienthal but was "unimpressed" by one of his gliders?

...that Lilienthal is considered the first, modern mass-media celebrity?

Question for a Century of Flight:

Had he lived, would Lilienthal have beaten the Wright Brothers to powered flight?

The debate on this question differs depending upon which side of the Atlantic you inhabit. German scientists and historians certainly believe that Lilienthal was definitely headed toward a powered airplane and was possibly only a year or less away from achieving that when he died. American aviation historians believe he was "years away" from accomplishing what the Wright Brothers did by building on his work.

Nationalism aside, it did take Lilienthal five years of extensive and painstaking experimentation to reach the bi-wing glider design, a design he considered feasible for mounting a motor. Even if he had taken another five to perfect a glider and engine combination, that would still have put his speculative powered flight at 1901, two years ahead of the Wrights. However, alternative history is the realm of science fiction writers, and what remains true is that the Wrights were inspired and assisted by Lilienthal's work. After all, they used body shifting to steer their initial gliders, incorporated their take on his wing warping design on later models, and put Charles Taylor's engine on essentially a bi-wing glider. On December 17, 1903, they became in America every bit the sensation he had been in the relatively new country of Germany.

But, could he have beat them to powered flight? Quite possibly, but that detracts none from the Wrights' accomplishment. Rather than competitors, I prefer to think of them as his heirs and that he might have felt the same about two men who shared with him the "indescribable pleasure" of flight.

Maintenance Alerts

Vigilant Pilot Averts Disaster

by Gregory J. Minarik

Starting this issue, the FAA Aviation News will be publishing selected articles from the Aviation Maintenance Alerts, Advisory Circular 43-16A.

In November 2002, the old adage of "wake up and smell the roses" took on a completely new meaning for Brandon McCabe, the 34-year old pilot of a Federal Express Feeder aircraft. West Air, Inc., operates the Cessna 208B model aircraft under the provisions of Title 14 of the Code of Federal Aviation Regulations part 135. Instead of "smelling the roses," the pilot used his keen sense of smell to avoid a major catastrophe.

While on a takeoff roll, the pilot detected smoke coming from the vent located between the windshield and the magnetic compass. There was no sign of fire; nevertheless, the quick-thinking pilot immediately aborted the takeoff as a precautionary measure. The aircraft was returned to the operator's maintenance facility without further incident.

Troubleshooting techniques conducted by the operator's maintenance technicians revealed the clock circuit breaker was tripped. When the aircraft was manufactured, Cessna installed additional wires as part of the original wire bundle. More specifically, the aircraft's electrical system was designed and built with the provisions of installing an hour meter. On the subject aircraft, an hour meter was not installed; however, the wiring was left in place for the hour meter.

The hour meter circuitry is comprised of two 20-gauge wires. One

OMB No. 2120-0003

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
MALFUNCTION OR DEFECT REPORT

OPER. Control No.
ATA Code
1. A/C Reg. No. N-

Enter pertinent data	MANUFACTURER	MODEL/SERIES	SERIAL NUMBER
2. AIRCRAFT			
3. POWERPLANT			
4. PROPELLER			

5. SPECIFIC PART *(of component)* CAUSING TROUBLE

Part Name	MFG. Model or Part No.	Serial No.	Part/Defect Location.

6. APPLIANCE/COMPONENT *(Assembly that includes part)*

Comp/Appl Name	Manufacturer	Model or Part No.	Serial Number

Part TT	Part TSO	Part Condition	7. Date Sub.

8. Comments *(Describe the malfunction or defect and the circumstances under which it occurred. State probable cause and recommendations to prevent recurrence.)*

Optional Information:

Check a box below, if this report is related to an aircraft

☐ Accident; Date _____ ☐ Incident; Date _____

DISTRICT OFFICE | OPERATOR DESIGNATOR
OTHER | COMMUTER | FAA | MFG. | AIR TAXI | MECH. | OPER. | REP.STA.
SUBMITTED BY:
TELEPHONE NUMBER ( ) —

FAA FORM 8010-4 (10-92) SUPERSEDES PREVIOUS EDITIONS

Use this space for continuation of Block 8 (*if required*).

wire was designated as the ground (negative) and the other was the power (positive) terminal. An in-depth examination revealed the hour meter ground wire was attached to the grounding point; the power wire was connected to the battery (via the clock circuit) and was generating electrical energy (i.e., it was "hot"). Upon closer inspection, it was discovered that the end of the power wire was not properly protected (exposed), had not been secured with a tiedown strap, and was dangling freely directly behind the radio rack in the cockpit. This wire was hidden and difficult to detect during scheduled inspections.

Since the wire was not capped and was improperly secured during the manufacturing process, the bare wire (approximately .031") managed to short out (arced) on a metal surface and began to burn. This arcing action tripped the clock circuit breaker and caused the smoke. The heat damage occurred when the exposed wire made contact (arced) with an unknown source behind the instrument panel.

As a corrective action measure, the maintenance technicians disconnected the affected terminal end at the circuit breaker, heat shrunk the terminal end for protection, and properly stowed the wire to ensure it was secure.

West Air, Inc., conducted a fleet campaign on all their Cessna 208B model aircraft and discovered numerous aircraft in their inventory that had the identical defect as previously referenced. This finding made it evident that a systemic problem existed. The operator submitted FAA Form 8010-4, Malfunction or Defect Report (M or D), for the affected aircraft to the Fresno Flight Standards Office (FSDO).

This occurrence prompted the investigating inspector at the Fresno FSDO to initiate a safety recommendation. Furthermore, the manufacturer will issue a Cessna Air Bulletin to address the safety-related concerns mentioned above.

The objective of the FAA's Service Difficulty Reporting (SDR) Program is to achieve prompt and appropriate fleet-wide correction of conditions adversely affecting the continued airworthiness of aeronautical products. The SDR program is an exchange of information/data and a method of communication between the FAA and the aviation community concerning inservice problems.

Therefore, an M or D report should be filed whenever a system, component, part, powerplant, propeller, or appliance fails to function in a normal or usual manner. If the foregoing has a flaw or imperfection that impairs (or may impair) future function, it is considered defective and should be reported under the SDR program.

The collection, collation, analysis of data, and the rapid dissemination of mechanical discrepancies, alerts, and trend information to the appropriate segments of the FAA and the aviation community provides an effective and economical method of ensuring future aviation safety.

Gregory J. Minarik is an FAA Aviation Safety Inspector (Airworthiness) at the Fresno (CA) Flight Standards District Office.

Service Difficulty Reporting Program

We welcome your comments, suggestions, and questions. You may use any of the following means of communication to submit reports concerning aviation–related occurrences.

Service Difficulty Reports (SDR) or Malfunction or Defect (M or D) may be submitted online via the Internet Web site at: <http://av-info.faa.gov/isdr/> or by mail to your local FSDO or to FAA, Aviation Data Systems Branch, AFS-620, P.O. Box 25082, Oklahoma City, OK 73125.

As depicted in this article, it is extremely vital and crucial to submit M or D reports to ensure public safety and eliminate any possible safety-of-flight hazards. One submitted report to the FAA may prevent hazards to property; but most important, it may save lives.

You can access current and back issues of Advisory Circular 43-16A, Aviation Maintenance Alerts, from the Internet at <http://afs600.faa.gov>. When the page opens select "AFS-640" and then "Alerts" from the drop-down menu. The monthly issues of the Alerts are available back to July 1996, with the most recent edition appearing first.

RUNWAY SAFETY CORNER

Runway Incursion Versus "Incursion" on the Runway

by Patricia Mattison

Runway incursions. What does that mean to you as a pilot? What does that mean to the general public? To the FAA, it is an extremely hot topic. The incidence of runway incursions throughout the United States has been on the rise, but many feel that this stems from the new awareness the aviation public has of the potential danger and are reporting more incidents. What we do know is that the aim of the Runway Safety Program is the reduction of runway incursions through education.

As pilots we are constantly aware of our surroundings when we are in an aircraft. This is especially true when we are going to a new area and an unfamiliar airport. Runway incursions occur for a variety of reasons. One of the causes could be misunderstanding or lack of communications. Another might be a lack of preparation when traveling to a new airfield. Whatever the cause the end result could be disastrous. Just what is a runway incursion anyway?

According to the *Runway Safety Report* (cy 1999-2001), "A runway incursion is any occurrence in the airport runway environment involving an aircraft, vehicle, person, or object on the ground that creates a collision hazard or results in a loss of required separation with an aircraft taking off, intending to take off, landing, or intending to land." This is only true when the control tower is in operation. However, that is the general idea. What about non-towered fields or when the tower is closed? Is a "runway incursion" a non-issue under those circumstances? Not in my book!

Here in Southeast Alaska we only have one airport with a control tower and that is in Juneau. All of the rest are non-towered fields. This is not to say that they are uncontrolled, and everything is pure chaos. They are simply non-towered. The pilots have the responsibility of controlling their own actions when operating in the non-towered environment.

Alaska is unique in that we have some of the most interesting types of "incursions." For instance, Alaska Airlines hit a deer at Ketchikan some time ago causing enough damage to delay the flight. Bears can be a problem as can moose, elk, wolves, porcupines, seal (yes, seals), pedestrians, and children, who seem to think a runway is great fun on a bike. Remote dirt runways can sometimes double as a road. Other than required airport vehicles, most vehicles do not have a radio to announce their presence on the runway. Other aircraft can be a problem too, when they use the runway without announcing their intentions on the local Common Traffic Advisory Frequency (CTAF).

Recently a pilot in a small town spoke to me of an airplane positioning on the runway to take off and almost being run over by an airplane that had just crossed the runway threshold. If it hadn't been for the approaching airplane's very aware pilot the end result would have been very tragic.

Back to awareness. When a pilot flies to an airfield that is new to that pilot or the conditions are unknown, a low fly-by to survey the field would be a smart choice. Many dirt strips are used during hunting and fishing season. Trees or other obstructions might have over grown the strip and weather might have eroded the landing area. Is that an incursion? Of course not! But animals that dart out from the brush could present an "incursion" situation that would be difficult to avoid. An elk or moose (which can weigh as much as 2,000 pounds) hit by a plane would surely destroy the plane, injure or kill the occupants, and ruin the animal's whole day. I mustn't forget to include birds.

There are huge flocks of birds that migrate every year. Rural airports in Southeast are frequently located near water where waterfowl come to rest along their journey or nest. Birds, when alarmed by an aircraft engine, will fly almost straight up and into the aircraft. Eagles have been known to dive at aircraft. I know of a bird strike where a goose penetrated the windscreen of an aircraft on approach to Yakutat. Fortunately, no one in the airplane was hurt, but the airplane was damaged and the bird was killed.

It doesn't matter if a pilot is at a towered or a non-towered airport. The collision of two obstacles can sometimes be deadly. We can, by being aware and cautious, change the threat of runway incursions, improve statistics, and prevent potential accidents.

Patricia Mattison is the Safety Program Manager at the Juneau, Alaska Flight Standards District Office.

• VFR Flight Not Recommended

Mr. Pearson's information in the article, "VFR Flight Not Recommended" (VNR), is spot-on. Although other factors involve the possible overuse of the VNR statement, and the fact that—unless you are asleep at the time—you don't encounter weather "inadvertently", his information places the responsibility right where it's supposed to be—between our ears. From both a pilot and FSS perspective, the addition of real-time traffic displays and sharing other assets between all ATC facilities can do nothing but help reduce the accident rate.

Flying here is Alaska; tourists need to be as informed as possible. There are many very good resources available, not the least of which are the fine men and women at the Canadian and U.S. facilities they talk to. I have been in the FSS option for 24 yeas, have worked and lived all over Alaska, as well as flow air taxi and my own aircraft for over 3,000 hours. I encourage anyone to give us a call or write.

Randy Rogers
Air Traffic Manager,
Fairbanks AT Hub

We are glad you liked the article and thanks for the tips for pilots flying to or in Alaska.

• URL Address Wrong

The article on special interest NOTAMS in the January/February issue had a Web site address for obtaining current NOTAMS. It didn't work when I tried to get into the site. What is the correct address?

Larry Dunn
Miami, FL

Evidently the Web site's address has changed since the magazine was published. The current address is: <www.faa.gov/ntap/index.htm>. If that doesn't work, go to FAA's homepage <www.faa.gov> and click on NOTAMS. That will bring you directly into the NOTAMS Website. Sorry for the confusion.

• Procedure Turns Revisited

I would like to expound on a previous question in September/October issue of FAA Aviation News, titled IFR Procedure Turn. The author, Mr. Owen Baker, asks if a pilot is required to fly a procedure turn, more specifically, holding-in-lieu of a procedure turn, before proceeding inbound on an approach within a non-radar environment? In addition, Mr. Baker asks for an official definition of a "course reversal?"

The answer to the first question can be easily found within Title 14 Code of Federal Regulations (14 CFR) §91.175. Subparagraph (j) limits when a pilot may not fly a procedure turn. Therefore, one can only infer that a procedure turn must be flown. The procedure turn is a critical maneuver and understanding why is significant.

The author provides two separate illustrations of an aircraft transitioning from an enroute navigational aid to the final approach segment. First, let us not confuse the difference between a published terminal route and a radial line identifying a fix makeup. In both cases, the radials identified were radial lines used to identify the initial approach fix and/or intermediate fix. A terminal route is depicted with a heavy or thin line depicting course, distance and altitude. A radial line, used only to define an intersection, is depicted as a thin line with the radial only pointed toward the identifying fix, and is absent of altitude or distance information. The second example is not a terminal route and therefore, cannot be utilized as a transition to join a segment of the approach.

However, the Williamsburg International, Newport News ILS RWY 07 Standard Instrument Approach Chart does depict a good example of a terminal route allowing for a transition from the enroute phase of flight to the approach phase. The Harcum VORTAC (HCM) R-185 to JAWES Initial Approach Fix (IAF) requires that a procedure turn be flown. Keep in mind that the HCM transition is provided to permit a descent from the enroute altitude, which can be significantly greater than the 2,000 FT MEA published along the route.

Criteria determining when a NoPT segment should be published is contained within the United States Standard for Terminal Instrument Procedures (TERPs). TERPs determine if the procedure turn is necessary. CFR Part 97 prescribes that all civil approach procedures will be designed to meet the criteria as established within the TERPs Manual. The guidance contained within the TERPs Manual can be somewhat involved in its application; therefore specifics will not be mentioned. In the example sited in the above paragraph, the procedure turn would be required because of the length of the subsequent intermediate segment. The alignment between the HCM R-183 and the localizer final approach course is excessive. It would preclude a pilot from safely maneuvering the aircraft within the confined protected airspace established for the intermediate segment prior to reaching the final approach fix.

Although not as obvious, a descent from the initial approach to the intermediate approach segment can also dictate the need for a procedure turn. Upon crossing the intermediate fix, the pilot must have the aircraft stabilized on course. At the same time, the aircraft is being configured for landing. Because of this workload, the descent gradient criteria is substantially less during the intermediate segment phase of flight as compared with any other phase throughout the approach procedure. In many cases, an aircraft may be too high to ensure a stabilized descent path within the intermediate approach segment. The procedure turn will permit descent to the final approach fix altitude within

the descent gradient tolerances prescribed for the intermediate segment.

The phrase, "Course Reversal" is used throughout many aviation publications. The author appears to be correct. "Course reversal" is not specifically defined within CFR Part 1, Definitions and Abbreviations. CFR §97.3, Symbols and terms used in procedures, however, does define a procedure turn under subparagraph (p). The definition, in part, is as follows, "Procedure Turn means the maneuver prescribed when it is necessary to reverse direction to establish the aircraft on an intermediate or final approach course." The Instrument Flying Handbook's definition of a procedure turn is also synonymous with the definition of a procedure turn in the CFR. It states in part, "a course reversal is necessary to proceed from the outbound course to the intermediate or final approach course."

My remarks are from my last 21 years as an FAA employee. I am presently a Flight Inspection Pilot at the Sacramento FIFO where we ensure the reliability of navigational aids as well as the flyability of all instrument flight procedures. Prior to becoming a Flight Inspection Pilot with the FAA, I was a supervisor in the development of Instrument Flight Procedures as well as a Radar Air Traffic Controller at a busy TRACON. I certainly hope that this will assist in clarifying any misconceptions as the when and why the procedure turn may be required for your readers. Although the procedure turn may be required by regulations, it is helpful to understand why this maneuver is established.

Keep up the good work with FAA Aviation News.

Paul Koscheka
FAA Flight Inspection Field Office
Sacramento, CA

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to H. Dean Chamberlain, FORUM Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address:

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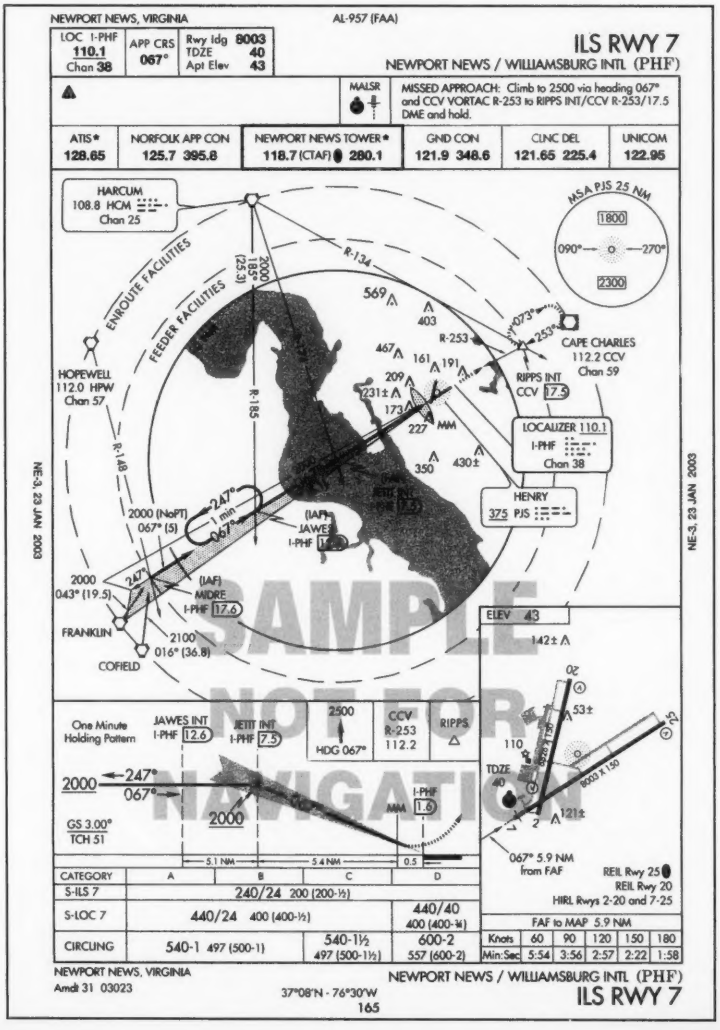

FAA-ISSUED AIRMAN CERTIFICATE INELIGIBILITY BASED ON SECURITY GROUNDS

In the January 24, 2003, *Federal Register*, the FAA published a final rule which puts in place processes for the Transportation Security Administration (TSA) to notify an individual that he or she has been determined to pose a national security threat and to advise the FAA of its determination. The FAA is adding a section to Title 14 of the Code of Federal Regulations (14 CFR) parts 61, 63, and 65 to expressly make individuals who pose a security threat as determined by the TSA ineligible to hold certificates, ratings, and authorizations issued under those parts. This ineligibility means that the FAA will not issue a certificate, rating, or authorization to any applicant who has received an Initial Notification of Threat Assessment from TSA. The FAA will hold in abeyance the application pending the outcome of the TSA's final threat assessment review. If an individual is issued a Final Notification of Threat Assessment, the FAA will deny an application for any airman certificate, rating or authorization.

With regard to certificates already issued, the FAA will suspend an individual's airman certificates after receiving the Initial Notification of Threat Assessment from the TSA. Suspension is appropriate in this circumstance, because the TSA's initial assessment that an individual poses a security threat is still subject to review by the TSA's Deputy Administrator and may be reversed. If at this point a U.S. citizen is still determined a threat, TSA's Under Secretary will make the final determination. If a Final Notification of Threat Assessment is issued, the FAA will revoke the certificates; if an Initial Notification is withdrawn, the FAA will withdraw its certificate suspension.

The eligibility standards adopted in this rulemaking rely on the threat assessments made by TSA. This reliance is based on the broad statutory authority and responsibility that the Aviation and Transportation Security Act, Public Law 107-71, placed in the Under Secretary with regard to intelligence information and threat assessments. The individual may respond in writing to this initial notification and provide any information the individual believes the TSA should consider.

CIVIL AVIATION REGISTRY WEB SITE ADDS AIRMEN SERVICES ACCOUNT

U.S. certificated airmen can open an online services account on the popular U.S. Civil Aviation Registry web site operated by the Federal Aviation Administration in Oklahoma City, at <http://registry.faa.gov>.

The site has many other aircraft and airmen information options and averages nearly 2,500 visitors daily.

The new service allows airmen to update their mailing addresses, as required by Federal aviation regulations. FAA needs current data to provide safety-related information to airmen as it becomes available.

Future services will include the ability to receive Aviation Safety Program flyers through electronic mail. The Registry mails more than six million such flyers each year. The new service would not only allow airmen to receive this information electronically, but would save the FAA a part of the significant expense associated with printing and mailing many of these safety bulletins, said Mark Lash, Registry manager.

"Future services could also include ordering replacement certificates, replacement knowledge test results, and a copy of the airman's complete certification file," he said.

The Civil Aviation Registry in Oklahoma City manages and operates the national records system and database for the issue of all FAA airman certificates and the legal content of all airman certification records. The Registry directs the planning, development, and implementation of the regulations and systems associated with the registration of U.S. civil aircraft.

The Registry Web site provides full sets of both the aircraft and airman databases, various forms used to do business with the Registry, and other useful information. In addition, there are services that can be requested and paid for online. Databases may be downloaded which include all information for aircraft. For airmen, Privacy Act information is not included, and addresses are not shown for airmen who chose not to have their address released.

Registry staff responds to hundreds of thousands of customers each year. They issue more that 60,000 aircraft registration certificates and 180,000 airman certificates, and answer more than 140,000 telephone calls. They reserve 17,000 special aircraft registration numbers (N numbers), provide 200,000 copies of records, and update more than 108,000 addresses.

Registry systems also provide information to FAA aviation safety inspectors, National Transportation Safety Board investigators, and law enforcement agencies to support aviation safety activities.

TSA ISSUES AIRSPACE CONTROL MEASURES IN NATIONAL CAPITAL REGION

FAA in conjunction with the Transportation Security Administration (TSA) has enhanced airspace control measures in the National Capital Region to a level consistent with National Threat Level Orange.

"Terrorists are known to favor targets in the transportation sector and to consider our civil aviation system an arsenal of improvised weapons," said DOT Under Secretary James M. Loy,

head of the Transportation Security Administration. "The Washington capital region is home to a number of particularly symbolic targets which must be protected. We appreciate the cooperation of the general aviation community as we implement sound security measures and tighten our defenses during this period of heightened alert."

The new airspace control measures create an Air Defense Identification Zone (ADIZ) in the airspace under 18,000 feet in roughly a 30-mile radius around Washington, and further enhance security measures in the 15-mile Flight Restricted Zone around the district. (The text of the NOTAM and a detailed map of the affected area are available at <www.faa.gov> or your local Flight Service Station.) Agency officials said they had designed the restrictions to increase security while allowing local general aviation airports to remain in operation.

"As pilots in the National Capital Region know all too well, proper preflight planning requires them to check for and review Notices to Airmen prior to every flight," said FAA Administrator Marion C. Blakey. "As all federal, local, and state agencies work together to respond to an increased threat level, the FAA will redouble its efforts to get the pilot community timely, accurate information and to balance current security needs with the needs of the flying public."

The new measures, which became effective at 6 a.m. Monday, Feb. 10, require general aviation pilots to maintain two-way radio communications, use a transponder and discrete beacon code, file IFR/VFR flight plans, and follow standard air traffic procedures before entering the ADIZ. All existing waivers in the Flight Restricted Zone have been cancelled, but will be re-evaluated and reissued by the TSA, as appropriate.

In response to the declaration of National Threat Level Orange (high risk), the TSA has taken a number of actions to increase the level of security across the nation's aviation system. TSA is enacting additional security measures for U.S. aircraft operators, U.S. airports, and international departures from the United States.

The TSA is coordinating with the FAA to ensure that appropriate flight restrictions are in place. The TSA requires increased inspections and surveillance of airport terminals and perimeters and areas controlled by aircraft operators as well as the posting of a law enforcement officer at all high traffic areas. Vehicle restrictions also have been implemented. Additionally, TSA is working with local law enforcement to increase security at general aviation fields in the Washington, DC region.

ATTENTION HIGH ALTITUDE PILOTS

Advisory Circular 61-107A, Operations of Aircraft at Altitudes Above 25,000 Feet MSL and/or Mach Numbers (Mmo) Greater Than .75, is now available. This revised advisory circular is of interest to pilots who are transitioning from aircraft with less performance capability to complex, high-performance aircraft that are capable of operating at high altitudes and high airspeeds. It was issued to alert pilots of the need to be knowledgeable about the special physiological and aerodynamic considerations involved in these kinds of operations. Remember, all Title 14 Code of Federal Regulations (14 CFR) part 91 pilots endeavoring to fly pressurized aircraft or aircraft capable of being operated above 25,000 feet MSL are required by 14 CFR §61.31(g)(1)and (2) to receive the appropriate ground and flight training.

For a free copy of this advisory circular, send your request to U.S. DOT, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785. Or you can download it from the Internet at <www.faa.gov>. Click on "Advisory Circular," "Regulation and Certification Advisory Circulars," and then type in "61-107A."

ADVANCED WEATHER SYSTEM AT AIR TRAFFIC FACILITIES

The FAA has added another key component to its long-term modernization plan by deploying advanced weather processing systems at all 20 air route traffic control facilities. The Weather and Radar Processor – called WARP – allows air traffic controllers to see more accurate, timely weather information on the same display that shows aircraft position data. WARP reduces the potential for weather-related accidents and lessens the impact of bad weather on air space capacity.

"When it comes to weather delays, controllers may not be able to fool Mother Nature, but WARP can help them steer clear of her," said FAA Administrator Marion C. Blakey. "We can now see the same weather that the pilots see and, as a result, make more informed decisions about rerouting traffic to reduce delays and increase efficiency."

Displayed on color monitors, WARP shows precipitation at three different altitudes. The system allows controllers to concentrate on the weather affecting a particular airspace sector and to see a more timely view of local precipitation. By seeing both the aircraft and the storm, where the aircraft is going, and when and where it will return to its original path, the controller is able to move other aircraft around more efficiently.

The color-coded weather information is shown as background graphics to the aircraft data on the display. The system provides much more accurate and localized information than earlier sources of weather data and the system it replaces.

Editor's Runway

from the pen of Mario Toscano

"...the Columbia is Lost!"

February 1st came and went as another historically somber day for America with the early morning loss of the Space Shuttle Columbia and seven astronauts. The *FAA Aviation News* staff joins the entire American family in grief, and extends its most sincere sympathy to the families of **Michael P. Anderson, David M. Brown, Kalpana Chawla, Laurel B. Clark, Rick D. Husband, William C. McCool** and **Ilan Ramon**. To these brave explorers this *FAA Aviation News* issue is humbly dedicated.

Administrator Marion C. Blakey sent NASA Administrator Sean O'Keefe condolences on behalf of all FAA employees. Blakey, who also wrote to all FAA employees, points out that "for decades, the FAA and NASA have worked closely on research to improve aviation safety and to push back the boundaries of the unknown in air and space. And, now in this time of their particular need, certainly the FAA continues to stand ready to help in any way we can. Our thoughts and prayers go especially to the families of friends of the seven brave astronauts who lost their lives to help extend the frontiers of knowledge and make life better for all of us."

NASA's 22 years of space shuttle history, for a total of 113 flights has been marked with extraordinary accomplishments and tragedy. We've seen five shuttles with *Columbia* the eldest, in service since the program's inception in 1981, with 28 missions. The *Challenger* came into service in 1983, flew 10 missions, and exploded on takeoff in 1986. *Discovery* came into service in 1984 and has flown 30 missions. *Atlantis* began service in 1985 and completed 26 missions, while *Endeavour* began service in 1992 for a total of 19 flights.

Despite this major aviation disaster that claimed our space shuttle, and seven heroic astronauts, again we came together as a nation vowing to forge ahead with our passion for flight. So, we turn in search of new aviation conquests as we begin the second century of flight. The FAA's motto in celebration of 100-years of flight is appropriately "Charting the Next Century of Flight." In this issue we begin introducing readers to a renewed and invigorated general aviation with our lead article on "FAA/Industry Training Standards." It is an example of our public service role in the pursuit of aviation safety during these extremely challenging times for general aviation.

We salute our heroes of today who are answering to the greater call. The *FAA Aviation News* web mail is pouring in with messages from Americans coming together to mourn this tragic loss, but also stand firm behind "our valuable space program." We will not be deterred from our ultimate goal to prosper and advance humanity. Aviation will continue on, others will join in the conquest of new frontiers to insure that this episode is properly written and celebrated in the history pages of the second century of flight. And, to celebrate the Centennial of Flight, we offer our most sincere spiritual thought: let's go out and fly!

We'll see you on the runway!

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